

State of Florida



# Public Service Commission

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**-M-E-M-O-R-A-N-D-U-M-**

**DATE:** August 6, 2008  
**TO:** Office of Commission Clerk  
**FROM:** Keino Young, Senior Attorney *KY*  
 Office of General Counsel  
**RE:** Docket No. 080009-EI - Nuclear cost recovery clause.

RECEIVED-FPSC  
 08 AUG - 6 PM 3:39  
 COMMISSION  
 CLERK

Attached for filing in the above-referenced docket are the original and six copies of the Direct Testimony of CARL VINSON and ROBERT LYNN FISHER, on behalf of Commission Staff.

KY/tfw  
Attachment

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 ECR \_\_\_\_\_  
 GCL \_\_\_\_\_  
 OPC \_\_\_\_\_  
 RCP \_\_\_\_\_  
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DOCUMENT NUMBER-DATE

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FPSC-COMMISSION CLERK

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Nuclear cost recovery clause.

DOCKET NO. 080009-EI

DATED: AUGUST 6, 2008

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that one correct copy of the DIRECT TESTIMONY OF CARL VINSON and ROBERT LYNN FISHER has been served by U.S. mail to the following on this 6th day of August, 2008:

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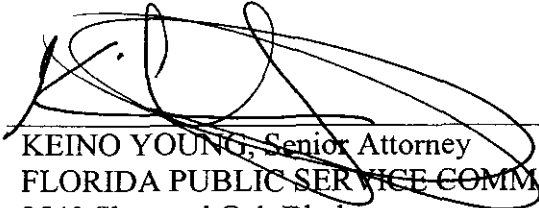
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FPSC-COMMISSION CLERK

1                                   **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2   **COMMISSION STAFF**

3                   **DIRECT TESTIMONY OF CARL VINSON AND ROBERT LYNN FISHER**

4   **DOCKET NO. 080009-EI**

5   **AUGUST 6, 2008**

6

7   **Q.     Mr. Vinson, please state your name and business address.**

8   A.     My name is Carl Vinson. My business address is 2540 Shumard Oak Boulevard,  
9   Tallahassee, Florida 32399-0850.

10

11 **Q.     By whom are you employed?**

12 A.     I am employed by the Florida Public Service Commission as a Public Utilities  
13 Supervisor.

14

15 **Q.     What are your current duties and responsibilities?**

16 A.     I supervise a section of management auditors in the Bureau of Performance Analysis of  
17 the Division of Regulatory Compliance. My group performs reviews and investigations of  
18 Commission-regulated electric, telephone, gas and water utilities, usually focusing on the  
19 effectiveness of management and company practices, adherence to company procedures and  
20 the adequacy of internal controls. Written audit reports such as the ones attached to this  
21 testimony are prepared by the auditors under my direction and supervision.

22

23 **Q.     Please describe your educational and relevant experience.**

24 A.     I earned a Bachelor of Business Administration degree in Finance from Stetson  
25 University in 1980. From 1980 to 1984 I worked as a bank loan officer, and from 1985 to

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1 1989 I worked as a research analyst for Ben Johnson Associates, a consulting firm specializing  
2 in utility regulation.

3  
4 At Ben Johnson Associates, I participated in regulatory proceedings and dockets in  
5 several states, including two nuclear unit prudence proceedings in Texas. From 1987 through  
6 1989, I assisted in the analysis of prudence issues regarding the South Texas Project and the  
7 Palo Verde Nuclear Generating Station. In both instances, the inclusion of construction costs  
8 in rate base was contested due to schedule delays and project management problems that led to  
9 substantial cost overruns. In each case, the assignments required extensive research into the  
10 owning utilities' processes for decision-making, contractor selection, oversight of project  
11 contractors, project status reporting, and project cost tracking.

12  
13 I joined the Commission staff in 1989 as a management auditor and served in that  
14 capacity until 1999 when I became the section supervisor. The audits I have performed and  
15 overseen have covered a wide range of issues and industries. During my time with the  
16 Commission, my work related to nuclear prudence issues included participation in a docket  
17 examining the causes and costs of an extended maintenance outage during 1997 at Progress  
18 Energy-Florida's Crystal River 3 unit. These issues were resolved via a settlement among the  
19 parties, and no audit report was necessary.

20  
21 **Q. Mr. Fisher, please state your name and business address.**

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

1 **Q. By whom are you employed?**

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

4  
5 **Q. What are your current duties and responsibilities?**

6 A. I perform reviews and investigations of Commission-regulated utilities, usually  
7 focusing on the effectiveness of management and company practices, adherence to company  
8 procedures and the adequacy of internal controls. I assisted Mr. Vinson in conducting reviews  
9 of project management internal controls of nuclear plant uprate and new construction projects  
10 underway at Florida Power & Light Company and Progress Energy of Florida.

11

12 **Q. Please describe your educational and relevant experience.**

13 A. In 1972, I graduated from Florida State University with a Bachelor of Science degree  
14 in Marketing. My relevant background includes approximately nineteen years with the  
15 Florida Public Service Commission in management auditing, utility investigation, and  
16 complaint resolution. Prior to joining the Commission in 1989, my experience included more  
17 than twelve years of experience within the telephone industry, in both regulated and non-  
18 regulated environments, where I have managed multi-state marketing operations for a large  
19 independent telephone company, assisted with implementing corporate level training  
20 programs, and conducted operations reviews as a member of the corporate Market Planning  
21 Staff. Since joining the Commission, I have participated in numerous reviews of utility  
22 operations, processes, systems and controls.

23

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

25 A. Our testimony primarily consists of the attached audit reports entitled *Review of*

1 *Progress Energy – Florida’s Project Management Internal Controls for Nuclear Plant*  
2 *Uprate and Construction Projects* (Exhibit VF-1) and *Florida Power & Light’s Project*  
3 *Management Internal Controls for Nuclear Plant Uprate and Construction Projects*  
4 (Exhibit VF-2). These reviews were requested by the Commission’s Division of Economic  
5 Regulation to assist with the evaluations of nuclear cost recovery filings. The reports present  
6 evaluations of the project management internal controls to be employed by Progress Energy-  
7 Florida, Inc. and Florida Power & Light Company in managing both their uprate projects and  
8 new nuclear plant construction projects. The reports present our observations regarding the  
9 reasonableness and adequacy of the internal controls in place at this time.

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**Q. Are you sponsoring any exhibits?**

A. Yes, our audit reports are attached as Exhibit Numbers VF-1 and VF-2.

**Q. Are there any additional topics to be addressed in your testimony?**

A. Yes. We have some observations on the Commission’s nuclear cost recovery review process under Rule 25-6.0423. Since this is the first nuclear cost recovery proceeding, we believe it is appropriate to examine the process that has evolved this far and to determine how it can more efficiently and effectively serve its purpose. The relatively tight timetable of annual filings requires an efficient process that will allow timely but thorough cost recovery determinations.

Participating in these initial reviews of the uprate projects and the new unit construction projects for both Progress Energy-Florida, Inc. and Florida Power & Light Company has led us to conclude that improvements to the current process are needed. We believe that the companies should present significantly more affirmative support for the

1 reasonableness and prudence of their cost recovery requests.

2

3 We note that Progress Energy-Florida, Inc. witness Roderick and Florida Power &  
4 Light Company witness Reed did prefile testimony that is somewhat similar to what we are  
5 describing. However, we believe that even more extensive and detailed and examinations of  
6 internal controls and project management controls should be performed to fully substantiate  
7 their adequacy and effectiveness. In addition to this testimony, each company could provide  
8 an internal audit report describing a complete review of the adequacy and effectiveness of  
9 internal controls and project management controls.

10

11 Thorough prefiled testimony on the controls would help to establish a firm basis for  
12 each company's position that adequate oversight and controls exist to prevent imprudent or  
13 unreasonable expenditures. Internal audit results would serve to familiarize the parties with  
14 the relevant project management issues that arose during the preceding year and provide  
15 insight into how management corrected any problems noted. These vehicles would provide a  
16 starting point upon which the parties to the proceeding could build to develop a thorough  
17 assessment of the reasonableness and prudence of the costs requested for recovery.

18

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

20 **A. Yes.**

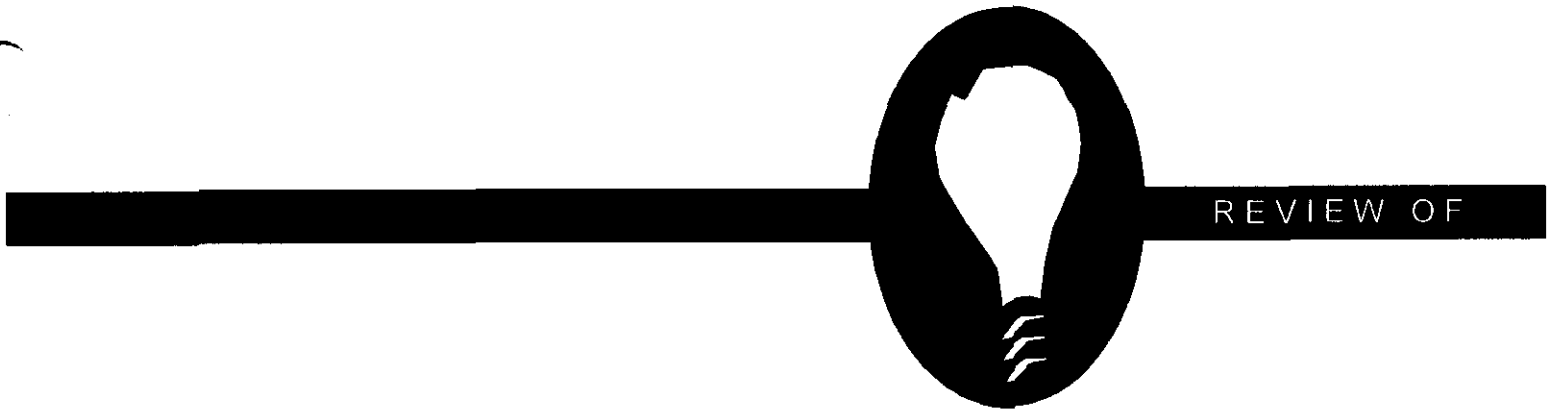
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Progress Energy-  
Florida's  
Project Management  
Internal Controls  
FOR  
Nuclear Plant Uprate  
and Construction  
Projects

AUGUST 2008

By Authority of  
The State of Florida  
Public Service Commission  
Division of Regulatory Compliance  
Bureau of Performance Analysis



*Review of*  
Progress Energy - Florida's  
Project Management Internal Controls for  
Nuclear Plant Upstate and Construction Projects

Carl S. Vinson  
Public Utilities Supervisor  
and  
R. Lynn Fisher  
Government Analyst II

August 2008

By Authority of  
The State of Florida  
Public Service Commission  
Division of Regulatory Compliance  
Bureau of Performance Analysis

PA-08-01-002

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## 1.0 Executive Summary

### 1.1 Purpose and Objectives

At the request of the Florida Public Service Commission's (Commission) Division of Economic Regulation, the Division of Regulatory Compliance conducted this review of the project management internal controls employed by Progress Energy-Florida (PEF) to execute the Crystal River Unit 3 uprate and the Levy Units construction.

The primary objective of this review was to document and evaluate the adequacy of project controls and internal controls the company has in place or plans to employ for these projects. The information and evaluations provided in this report are to be used by Division of Economic Regulation staff to assist in the assessment of the reasonableness of PEF's cost recovery requests for the two projects.

### 1.2 Scope

The internal controls examined were those related to the following key areas of project activity:

- ◆ Project Planning
- ◆ Project Management and Organization
- ◆ Cost and Schedule Controls
- ◆ Contractor Selection and Contractor Management
- ◆ Auditing and Quality Assurance

Internal controls are the vital mechanisms by which company operations are managed to stay within budget and on schedule. According to the Institute of Internal Auditors' *Standards for the Professional Practice of Internal Auditing*, appropriate internal controls allow the organization to accomplish the following:

- ◆ Produce accurate and reliable data
- ◆ Comply with applicable laws and regulations
- ◆ Safeguard assets
- ◆ Employ resources efficiently
- ◆ Accomplish goals and objectives

Well-constructed internal controls assist with the challenges of risk management and decision-making. Risks must be identified and appropriate protections must be established to prevent or control these risks. Prudent decision-making results from orderly, well-defined processes that address known risks, needs, and capabilities. Adherence to written procedures, effective communication, vigilant contractor oversight, and ongoing auditing and quality assurance are all essential for ensuring that project costs are incurred prudently.

## 1.3 Methodology

Planning and research for this review were performed in January and February 2008. Data collection, site visits and interviews, analysis and report writing were conducted between March and June 2008. The information compiled in this report was gathered via company responses to staff document requests, visits to both the Crystal River Unit 3 and the Levy County sites, and interviews with key project personnel. Staff also reviewed testimony, discovery and other filings in Docket Nos. 080009-EI, 080148-EI, and 080149-EI.

A large volume of information was collected and analyzed. Specific information collected from PEF included the following categories of documents:

- ◆ Company policies and procedures
- ◆ Organizational charts
- ◆ Requests for proposals
- ◆ Contractor bids and proposals
- ◆ PEF's bid evaluation analyses
- ◆ Project scope analysis studies by PEF and consultants
- ◆ Internal audit reports

Analysis of this information is discussed in detail in chapters 2 and 3.

## 1.4 Observations and Overall Opinion

The early stage of these projects limits audit staff's ability to draw final conclusions regarding some areas of controls that are in development or that will not to be deployed until later stages of the projects. Therefore, staff has examined only the completed portions of the project and internal control structure that are presently in place. Many of PEF's internal control systems are still in development and will continue to evolve as the projects progress.

These internal control tools will ultimately determine the success of these projects and the prudence of the company's actions. A complete determination of the reasonableness of the eventual control systems for management of these projects cannot be made at that this time. Further, any assessment made at this point in time cannot be expected to remain valid for the entire duration of the project activities.

In any controls assessment, adequate controls may be in place at any point, but the ultimate proof of adequacy comes when the project work is actually performed. Beyond planning, the vast majority of the work of these projects has not yet been performed.

Further, though internal controls in place for any undertaking may be deemed adequate at the outset, it cannot ensure that they will be followed and used properly. Verification of adherence to procedures and careful examination of changes to control systems are essential

ingredients to evaluating the reasonableness of management's actions. Audit staff believes continued internal and external oversight is necessary over the lifespan of these projects. Of particular importance are internal audits and quality assurance audits. These audits should provide broad coverage of internal controls, procedural adherence, and project management issues.

The unique first-time nature of the 2008 nuclear cost recovery proceedings presented several challenges. Audit staff believes its review was limited in time and depth by schedule constraints in this first year of cost recovery filings. Also, though PEF fully accommodated requests for access to key managers and plant sites, audit staff has concerns about the completeness of some responses to its data requests. Audit staff believes that PEF should work to eliminate these issues in future reviews.

### **Crystal River 3 Uprate Project Observations**

Audit staff made the following observations for the key areas of activity it examined on the Crystal River 3 Uprate Project. The conclusions in each instance are subject to the limitations inherent in the information that was available to staff during March through June 2008.

#### **Project Planning**

- ◆ The PEF scope evaluation process appropriately provided technical and managerial evaluation of the risks, costs, benefits, and overall feasibility of the Crystal River 3 uprate project.
- ◆ PEF has appropriately proceeded with the required regulatory approvals, scheduling, and preparation of applications in a manner that will accommodate the planned project completion dates.
- ◆ PEF's approach to project planning has been appropriate and adequate progress has been made in developing the project plan. PEF project management believes no threats to meeting uprate project schedules exist at this time.
- ◆ PEF has conducted a reasonable identification and assessment of potential risks to successful completion of the uprate project. Project success will require continued vigilance in risk management by PEF.

#### **Project Management and Organization**

- ◆ Oversight of the CR3 uprate project by PEF's Nuclear Projects and Construction organization will be an essential element to the project's success. Though still being staffed, the project management organization appears to be appropriately structured and managed at this time.

- ◆ A framework for adequate oversight of project management by senior management exists. Plans for communications within the project management organization appear to be appropriate at this time.

### **Cost and Schedule Monitoring Controls**

- ◆ Cost and schedule monitoring controls are still in the process of development and deployment at this early stage. Limited results are available for assessing these controls at this time.

### **Contractor Selection and Contractor Management**

- ◆ PEF appears to have followed its contractor selection procedures. Given the unique challenges and circumstances of the nuclear industry, PEF's use of sole source selections for the CR3 uprate project to date is in keeping with reasonable business practices.
- ◆ PEF's approach to contractor oversight and evaluation appears to be appropriate to date. Proactive project management by PEF should require frequent communication and updates, demand contractor accountability, and challenge information provided by contractors.
- ◆ PEF has made efforts to ensure effective contractor performance by means of protective contract provisions and contract structure. This approach appears to have appropriately sought risk-sharing through incentives and penalties.

### **Auditing and Quality Assurance**

- ◆ PEF's audit and quality assurance capabilities are appropriate. At this early stage, audit coverage appears adequate. These controls have already proven their value in encouraging adherence to procedures. As the project progresses, more frequent internal audits and quality assurance audits will be necessary for the success of the Crystal River 3 uprate project.

### **Levy Units 1 and 2 Construction Project Observations**

Audit staff made the following observations for the key areas of activity it examined on the Levy Units 1 and 2 construction projects. The conclusions in each instance are subject to the limitations inherent in the information that was available to staff during March through June 2008.

### **Project Planning**

- ◆ PEF's site selection and acquisition efforts appear to have been appropriate and in keeping with good business practices.

- ◆ PEF's plant design selection process was reasonable and effective in positioning the company to meet the anticipated need for capacity in 2016.
- ◆ PEF's efforts to secure an engineering, procurement, and construction contract appear to have been effective and appropriate. The basic structure of the Letter of Intent regarding engineering, procurement, and construction services appears reasonable.
- ◆ PEF has appropriately proceeded with the required regulatory approvals, scheduling, and preparation of applications in a manner that will accommodate the planned project completion dates.
- ◆ PEF appears to have taken a reasonable approach to developing project plans at this early stage.
- ◆ PEF has conducted a reasonable identification and assessment of potential risks to successful completion of the Levy project. Project cost and schedule success will require continued vigilance in risk management and re-assessment of project viability at key decision points.

#### **Project Management and Organization**

- ◆ Effective oversight of the Levy project by PEF's Nuclear Projects and Construction organization will be an essential element to the project's success. Though still being staffed, the project management organization appears to be appropriately structured and managed at this time.
- ◆ A framework for adequate oversight of project management by senior management exists. Plans for communications within the project management organization appear to be appropriate at this time.

#### **Cost and Schedule Monitoring Controls**

- ◆ Cost and schedule monitoring controls are still in the process of development. Limited results are available for assessing these controls at this time.

#### **Contractor Selection and Contractor Management**

- ◆ PEF appears to have followed its contractor selection procedures. Given the unique challenges and circumstances of the nuclear industry, PEF's use of sole source selections for the Levy project to date is in keeping with reasonable business practices.
- ◆ PEF's approach to contractor oversight and evaluation appears to be appropriate to date. Proactive project management by PEF should require frequent



communication and updates, demand contractor accountability, and challenge information provided by contractors.

- ◆ PEF has made efforts to ensure effective contractor performance by means of protective contract provisions and contract structure. This approach appears to have appropriately sought risk-sharing through incentives and penalties.

#### **Auditing and Quality Assurance**

- ◆ PEF's audit and quality assurance capabilities are appropriate. At this early stage, audit coverage appears adequate. These controls have already proven their value in managing contractor effectiveness. As the project progresses, more frequent internal audits and quality assurance audits will be necessary for the successful completion of Levy Units 1 & 2.

## 2.0 Crystal River Unit 3 Uprate Project

### 2.1 Project Planning

#### **How did PEF identify the scope of work for the CR3 uprate project?**

PEF conducted early internal engineering assessments of the viability of pursuing a CR3 uprate. This effort yielded a set of targeted desired CR3 output and operating parameters that appeared to be attainable. The uprate project was proposed to senior management and the Board of Directors for approval through the Business Analysis Package (BAP) process in November 2006. The benefits and justification for the uprate were analyzed and addressed in the BAP presentation. It included cost/benefit ratio analyses, cost scenario analyses (base case/worst case/best case), schedule estimates and risk analyses. Approval of the BAP by senior management and the Board set the stage for detailed evaluation of the project.

Since PEF had not conducted an uprate of this magnitude in Florida, PEF began formal evaluation by commissioning a scoping study by AREVA NP, Incorporated. The major task was to identify the component change-outs needed to accommodate the uprate and its targeted MW gain. AREVA assessed existing component conditions and plant margins to determine which components were capable of supporting post-uprate operations, and it identified those which needed to be replaced or modified.

AREVA's study was presented to PEF project management in May 2007. It confirmed the need to replace low pressure and high pressure turbines, the turbine generator, moisture separator reheaters and their belly drains, feed water heaters, heat exchangers, and other components such as pumps, motors, piping, valves and drains. AREVA also assessed the timetable for the uprate and recommended a basic plan for the timing of the work based upon PEF's refueling outages scheduled for 2009 and 2011.

PEF assembled an advisory panel to help evaluate AREVA's study and recommendations to ensure that adequate design margin was preserved. The panel was comprised of company employees, independent industry experts, and vendors. Along with the feasibility and scoping effort, the company and AREVA's engineering assessments helped further quantify costs of the work.

**The PEF scope evaluation process appropriately provided technical and managerial evaluation of the risks, costs, benefits, and overall feasibility of the Crystal River 3 uprate project.**

#### **What regulatory approvals are required for completion of the project?**

Since uprates change a nuclear unit's licensed power level, utilities must apply for NRC permission to amend their operating licenses. The license amendment request (LAR) process for

requesting NRC approval to increase a plant's authorized power level is governed by 10 CFR 50.90-92. The application is required to provide full descriptions of the planned changes. The first phase of uprate work has been approved by the NRC and was completed by PEF during the 2007 refueling outage. The second phase, consisting largely of preparation for the third phase, did not require NRC approval. The third phase, which provides the bulk of the MW gain, requires NRC approval and PEF plans to submit the application in 2009. Approval is expected in 2010 and the work is scheduled for the 2011 refueling outage.

The NRC reviews data and accident analyses submitted by a licensee to confirm that the plant can operate safely at the higher power level. The NRC uses a review standard for extended power uprates that has been endorsed by the Advisory Committee on Reactor Safeguards. After the NRC completes its review of the application and takes action on any applicable public comments, hearing requests, or Advisory Committee on Reactor Safeguards recommendations, the agency may approve or deny the request.

At the state level, the Florida Public Service Commission's approval for the CR3 uprate was obtained under the requirements of Sections 403.507(4) and 403.519(3), Florida Statutes. A Determination of Need proceeding, Docket No. 060642-EI, led to approval of the planned uprate in February 2007.

Florida Department of Environmental Protection (DEP) approval of a Site Certification Application is required for plant uprates of 75 MW or more. As directed by Sections 403.501-401.518 Florida Statutes, DEP coordinates with other state and local agencies to assess public health and environmental aspects of the planned uprates. Ultimately, certification is decided by the Siting Board (Governor and Cabinet) or in a non-contested case by the Secretary of the Department of Environmental Protection on behalf of the Board. PEF submitted its CR3 Phase III application in late 2007; approval is expected in late 2008.

PEF must ensure continued compliance with DEP's requirements under its increased power level operations. For example, the company has conducted an analysis of the impact of higher temperatures at the plant's discharge canal. This led to studies of cooling tower options discussed later in this report. Placement of possible new cooling towers on the existing site required communication with the Department of Environmental Protection regarding environmental impact and tower placement.

**PEF has appropriately proceeded with the required regulatory approvals, scheduling, and preparation of applications in a manner that will accommodate the planned project completion dates.**

**Has PEF developed a project plan to meet the desired project completion dates?**

Since the ongoing operation of CR3 is essential to PEF's customers, the uprate activities were scheduled for completion during the 2007, 2009, and 2011 refueling outages. Detailed

planning is intended to allow these biennial outages to provide windows of time that will allow completion of the uprate work in three phases.

The first phase of work, the Measurement Uncertainty Recapture phase, was completed on schedule during the fall 2007 refueling outage. Sensitive and highly accurate digital metering equipment was installed to more precisely measure main feed water flow. This more precise read-out on main feed water flows provides better data to CR3's plant operators, allowing safe operation at higher pressures and temperatures. This modification yielded a 12 MW generating capacity gain.

The second and third phases of work are currently being planned and scheduled in detail. These phases are expected to add 168 MW of capacity, resulting in the total gain of 180 MW. Phase 2 will occur during the approximately [REDACTED] 2009 refueling outage. Work will proceed for about 70 days of the outage, but the longer critical path of work will be the replacement of the steam generator which is needed apart from the uprate.

Future phases include installation of the major components. Long-lead items will drive the critical path of the entire project, and are key plant components for which few manufacturers exist worldwide.<sup>1</sup> This limited production capacity has required PEF to carefully consider the timing of procurement decisions and component ordering.

Negotiations with key contractors were undertaken at an early stage so PEF could determine when orders had to be placed in order to reserve production capacity. Management believed that the substantial lead time on components such as turbines required quick decision making and vendor selection. By entering into negotiations at an early point with vendors such as Siemens Corporation for long lead-time components, PEF believes it secured advantageous prices and a position in queue that will support the needed project completion date. According to project management, similar orders of these components by other utilities have since been placed at much higher prices.

**PEF's approach to project planning has been appropriate and adequate progress has been made in developing the project plan. PEF project management believes no threats to meeting uprate project schedules exist at this time.**

### **Was PEF's risk evaluation for the CR3 uprate project reasonable?**

As mentioned, Progress Energy Corporation has completed uprates of its North Carolina nuclear units. PEF is also familiar with the nationwide experience with uprates by other nuclear utilities through industry sources and associations. Information regarding lessons learned from uprate activities is readily shared through industry organizations such as the Institute for Nuclear Power Operations (INPO). In its uprate project plan, PEF emphasized maintaining a focus on industry experience as a key success factor.

---

<sup>1</sup> *Toronto Star*, "Nuclear revival bumps against atrophy" May 3, 2008  
<<http://www.thestar.com/Business/article/420941>>

Several project risks were identified and considered in the company's decision to go forward with the CR3 uprate project. At the time of the CR3 uprate decision, PEF's procedures regarding major capital projects (those in excess of \$50 million) required it to be proposed via a Business Analysis Package (BAP.) During 2007, PEF began to migrate its major projects towards its new Integrated Project Plan (IPP) process for approval and control. The IPP process still includes the identification and assessment of key risks and risk management approaches, but provides senior management with more frequent and continuing opportunities to endorse or redirect the project. Like the BAP, the IPP documents assumptions, constraints and decisions to be made, defines approval requirements for funding, and provides a baseline for the progress measurement and project control.

The initial BAP for the uprate project was completed in November 2006. It outlined the project's phases and a cost estimate of about \$427 million. This was comprised of a base \$250 uprate work estimate plus \$89 million for transmission upgrades, and \$88 million for cooling tower upgrades. This cost estimate also included studies that would allow for development of the plant-specific project plan including schedule and specifications. In the BAP, PEF used modeling to develop sensitivity analyses of assumptions and to quantify potential outcomes of the risks being assessed. These model runs led to outputs of base case, worst case, and best case scenarios for various combinations of assumptions. For each scenario, PEF developed cost/benefit ratios, break-even year projections, and net present value analyses.

The BAP identified and examined potential project risks. The following risks were identified and addressed:

- ◆ Project costs incurred exceeding current estimates
- ◆ Delays caused by late ordering of key equipment components
- ◆ Delays caused by increasing demand on nuclear industry manufacturers
- ◆ Derates of coal-fired Units CR1 and CR2 caused by insufficient cooling water temperature reduction
- ◆ Increasing project costs due to over-estimated cooling needs and capacity
- ◆ Projected fuel savings eroded by falling gas, oil, and coal prices
- ◆ Delays in NRC approval of uprate

A central strategy identified for mitigating several of these risks, including potential cost overruns, late ordering of key components, and the high demand for manufacturers, was to engage a primary contractor for the uprate design and implementation work and to provide project management oversight through the new Nuclear Projects and Construction Department. PEF project management stressed that active contractor oversight and control are essential to both cost control and overall project success.

Both the uprate activity and the planned new units will create and sustain a high demand among nuclear industry suppliers, manufacturers, contractors, and contract employees for years to come. Concerns regarding the availability of manufacturers and contractors prompted the company to maintain an accelerated contract award process. The company targeted completing major contracts in early 2008. PEF management sought further protection from cost overruns by negotiating contracts that required some risk sharing with vendors for schedule delays or quality problems.

Through the use of fixed-price contracts, some risk is assumed by contractors. Standard contract provisions specify liquidated damages and/or remedies for breaches and performance failures. PEF planned to also address labor and material cost uncertainty by making contingency funding available.

To address the risk that the uprate could adversely affect the coal-fired Crystal River Units 1 and 2 next door, the company contracted with Sargent & Lundy for an engineering study of possible cooling tower solutions. The risk was that higher point of discharge temperature by the updated CR3 plant could require PEF to reduce the temperature in the shared canals by "throttling back" CR2 operation. A Phase I study addressed the challenge of correctly sizing cooling needs, and was completed in 2008. The Phase I study recommended specific cooling tower sizing and configurations that are under consideration by project management. A Phase II study is underway.

The risk of NRC approval being delayed was considered unlikely based upon prior approvals granted. Though the CR3 uprate represents the first major uprate of a Babcock & Wilcox plant, PEF did not expect this fact to extend the approval process.

An additional challenge identified by project management is the site logistics for a peak employee population of 3,000 during 2009 uprate work. Solutions are in progress, with several options explored for parking, worker transport, and on-site worker support.

The resurgence of the U.S. nuclear industry has already impacted the NRC as it processes the numerous license applications that will be involved. The CR3 extended power uprate LAR will be submitted to the NRC in mid-2009, and PEF expects the NRC review and approval process to take 12 to 18 months. PEF management has viewed early application as being essential to reducing schedule risk and has acted to carry out this priority. Therefore, staff believes that backlog issues at the NRC are beyond the company's control, and early application with a well-prepared License Amendment Request is the only viable countermeasure. At present, PEF project management believes the company's NRC application efforts and schedule should produce approvals without delays to project completion.

**PEF has conducted a reasonable identification and assessment of potential risks to successful completion of the uprate project. Project success will require continued vigilance in risk management by Progress Energy-Florida.**

## 2.2 Project Management and Organization

### Is an appropriate project management organization in place for the CR3 uprate project?

PEF created a new support organization to manage and support the CR3 uprate and Levy projects. This organization, headed by the Vice-President – Nuclear Projects and Construction, is displayed in **Exhibit 1**. Having served previously as the Director of Site Operations for CR3, he had complete responsibility for CR3 and is appropriately familiar with its configuration, history, and operation.

PEF NUCLEAR PROJECTS AND CONSTRUCTION ORGANIZATION

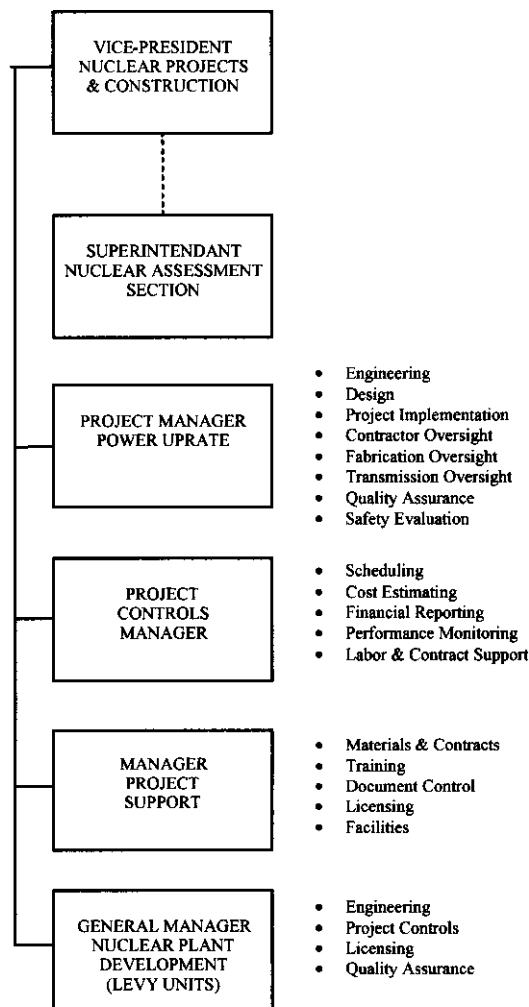


EXHIBIT 1

Source: PEF Response to Data Request 3-4.

Nuclear Projects and Construction provides dedicated resources focused on the CR3 uprate and the Levy project. This structure is intended to provide adequate resources for management of these major projects, while also reducing potential negative impacts upon the essential ongoing CR3 plant operations. The NRC has instructed utilities to prevent uprate work activities from becoming impediments to normal operations. The potential for disruption to ongoing CR3 operations would increase if plant employees were "borrowed" for uprate work and support.

Operating apart from the existing CR3 operations structure, approximately 140 Nuclear Projects and Construction employees will provide project management and support for the work activities of contractors and vendors. As of February 2008, approximately 90 of these positions were filled or in the process of being hired. Most of the remaining positions were being actively recruited, while some were not planned for hiring until later stages of the project.

A key component of this organization from the standpoint of project management is the Project Controls group. The three sections of this unit are responsible for schedule monitoring and reporting, financial reporting and cost tracking, and work management and estimating. The Project Controls group is charged with detecting and reporting emerging problems with costs and schedules. This reporting is essential to allow management to take timely action to prevent or control problems. The Manager of Project Controls reports to the Vice-President – NP&C.

Other work units in the Nuclear Projects and Construction Department also support the uprate work. A large dedicated engineering group will perform vital oversight of work plan execution and fieldwork by contractors. A dedicated support group will provide material acquisition and licensing expertise.

To govern the activities of this new project management organization, the company is developing specific and detailed written procedures. A large portion of these procedures are complete. The procedures still in the process of development, are largely those pertinent to activity scheduled for future years. Where applicable, general PEF procedures still govern. Staff has obtained and reviewed a large sample of the completed procedures for appropriateness and completeness.

**Oversight of the CR3 uprate project by PEF's Nuclear Projects and Construction organization will be an essential element to the project's success. Though still being staffed, the project management organization appears to be appropriately structured and managed at this time.**

**Are appropriate oversight and accountability controls over project management in place?**

The reporting structure within the Nuclear Projects and Construction Department provides checks and balances to maintain oversight of work and independent assessment of work quality. CR3 project management is held accountable to senior management through a variety of information sharing mechanisms. Regular meetings and reports are intended to provide



information on schedule and budget status. Properly constructed, these reporting tools prevent problems from worsening due to lack of detection or intentional cover-up.

The key project managers are involved in a series of internal meetings where the project team self-examines progress and status. The Vice-President – Nuclear Projects and Construction meets daily with his direct reports and weekly with a larger segment of the project management team. Monthly, the entire project management team meets for an entire workday to assess progress, identify key challenges, and define solutions.

Quarterly updates on the uprate project are to be held with senior management under the Integrated Project Plan (IPP) process which was adopted in 2007. These meetings address significant project status, events and changes, and risks. The IPP process tracks schedule progress and budget performance for senior management information and decision-making. These IPP meetings provide senior management with opportunities to authorize continued work, or if warranted, to suspend a project.

CR3 project management also meets quarterly with the PEF Finance Committee. These meetings examine the project status, budget status, and capital needs.

Within the project structure itself, a series of periodic meetings exists. The following is a list of standing meetings specified in the project plan:

- ◆ Weekly
  - ▶Project Schedule Updates
  - ▶Progress and Issues
  - ▶Offsite Vendor Calls
  
- ◆ Monthly
  - ▶All Hands Meeting
  - ▶Management Review
  - ▶Vendor Status and Issues
  - ▶Project Sponsor Update
  
- ◆ Quarterly
  - ▶Project Overview with Senior Management
  - ▶Major Contractor Executive Management
  - ▶Financial Status
  - ▶Plant Nuclear Safety Committee
  - Safety Evaluations Risk Updates and Issues

**A framework for adequate oversight of project management by senior management exists. Plans for communications within the project management organization appear to be appropriate at this time.**

## 2.3 Cost and Schedule Monitoring Controls

### **Has PEF developed an adequate control system for monitoring uprate project schedules and costs?**

As noted, the Project Controls group within NP&C is dedicated to the cost and schedule tracking of the CR3 uprate. The three sections of this unit are responsible for schedule monitoring and reporting, financial reporting and cost tracking, and work management and estimating. The Project Controls group is the first line of defense for detecting emerging problems with costs and schedules. Once detected, any concerns can be further evaluated by Project Controls and/or brought to the attention for analysis by the on-site managers involved.

PEF's primary scheduling and schedule tracking tool is Artemis/ProjectView, a widely used project tracking and scheduling system. Through Artemis/ProjectView, actual versus projected schedule variances can be identified, analyzed, and recovery plans developed. Recurring reports can be provided to management, and customized reports can be developed as requested.

The Work Breakdown Structure is a key component of the project plan for every phase of the CR3 uprate activities. It is the detailed plan that allows each work activity to be identified, assigned, and sequenced. Each of the hundreds of specific tasks is assigned to a functional area manager and also to a specific task manager. The functional area manager is responsible for development of the task instructions and procedures for its completion, and the task manager is responsible for actual task completion. Once these tasks are compiled and planned for completion, they are reflected in Artemis/ProjectView and depicted in Gantt chart format to simultaneously illustrate the status of all tasks or rolled-up groups of tasks.

Monthly cost reports and financial summaries are provided to PEF business unit managers and executives. Similarly, project cost reports detailing the transactions charged to the project are provided to project managers. PEF indicates that similar monthly information is provided to the Chief Operating Officer and other senior management committee members.

As of December 31, 2007, project management reports showed total project costs and schedule were on target and satisfactory. This reflects the timely completion of the measurement uncertainty recapture phase of the project. Capital spending for the project will be spread out across the five years of the project's duration, with the largest portion in 2009.

As the project progresses with Phase II and the 2009 outage work, cost tracking will become an increasingly important activity. Cost status is also provided in the purchase order and invoicing process, where the Project Controls group examines each against the total contract and the remaining authorized funds.

**Cost and schedule monitoring controls are still in the process of development and deployment at this early stage. Limited results are available for assessing these controls at this time.**

## 2.4 Contractor Selection and Management

### Has PEF's selection of the current set of CR3 uprate contractors and vendors been reasonable?

Vendors and contractors for the CR3 uprate work must be approved by PEF and included on its Approved Suppliers List. PEF procedures specify that only vendors who are determined capable and commercially qualified should be included on the list.<sup>2</sup> Often, inclusion on the list depends upon obtaining references from other utilities, researching PEF's own history with the vendor and inspection of the vendor's facilities and products. Depending upon the nature of the work to be done, PEF is required by NRC regulations to make a full assessment of the vendor's Quality Assurance program as well.

Due to the highly technical and specialized nature of electric generation, and the nuclear industry in general, many services and products are provided by a small number of major vendors worldwide. This configuration creates some concerns, since the possibility of price-fixing increases in markets where there are few suppliers.<sup>3</sup> Industry mergers, partnerships, and corporate consolidations also present challenges that will require vigilance by PEF management to ensure the company receives fair pricing.

PEF's current vendors and contractors for the CR3 uprate were selected both through the competitive bid process and through the use of sole sourcing. In maintaining or enhancing an existing plant, the utility often must consult with and/or employ the original designer or original equipment manufacturer. Usually, these vendors continue to play major roles in the plant over its useful life.

PEF's procedures define sole sourcing as the selection of one single contractor, not on the basis that it is the only one qualified, but that it is the only one acceptable or available. Further, the procedures require sole source activity to be justified by the contract originator, and it must be approved at the appropriate management level for the dollar amount of expenditure involved.<sup>4</sup>

On the CR3 uprate project, eight contracts in excess of one million dollars are included in PEF's nuclear cost recovery filings. As shown in **Exhibit 2**, the key contract and the largest by far in dollar amount is the turbine retrofit contract with Siemens Corporation. The second, fourth, and fifth largest contracts are engineering contracts with AREVA-NP. The third largest contract is with Thermal Engineering for four moisture separator reheater units. The sixth largest contract

<sup>2</sup> Progress Energy Procedure MCP-NGGC-0001, p 21.

<sup>3</sup> In 2007, the European Union fined a group of major electric industry plant engineering firms and component suppliers for price-fixing. The fines totaled nearly one billion dollars. Several of the companies fined are either contractors for the new PEF and FP&L nuclear units, or have bid on components for these projects. "Siemens Hit with £400 Million Fine," *Der Spiegel* January 25, 2007 <<http://www.spiegel.de/international/0,1518,druck-462199,00.html>>, "European Union Fines Siemens, AREVA, Alstom for Price Fixing," *The Economic Times* January 25, 2007 <<http://economictimes.indiatimes.com/articleshow/msid-1438615,prtpage-1.cms>>.

<sup>4</sup> Progress Energy Procedure MCP-NGGC-0001, pp 8 & 20.

with Yuba Heat Transfer will supply replacement feed water heaters and secondary cooling heat exchangers for CR3.

The Siemens contract was awarded through a request for proposal process. PEF's analysis of the two bids received selected Siemens as better in terms of [REDACTED]. As noted, the early completion of this contract was necessary to secure access to manufacturing resources, competitive pricing, and to expedite completion by the targeted 2011 date. PEF project management reports that other utilities have subsequently entered into contracts of similar nature at significantly higher prices.

Crystal River 3 Uprate Project Contracts Greater Than \$1 Million			
Siemens	Turbine retrofit, all equipment & installation	RFP	[REDACTED]
AREVA -NP	NSSS and fuel engineering, LAR support	Sole Source -orig equipment manufacturer	[REDACTED]
AREVA -NP	Flow meter engineering and design	Sole Source -orig equipment manufacturer	[REDACTED]
AREVA -NP	Uprate balance of plant	RFP	[REDACTED]
Thermal Engineering	4 Moisture Separator Reheaters	RFP	[REDACTED]
Yuba Heat Transfer	Feed water heater	RFP	[REDACTED]
NuFlo Technologies	Purchase and installation of flow meter	Sole Source - master fleet contract	[REDACTED]
Atlantic Group	Flow meter installation	Sole Source - master fleet contract	[REDACTED]

**EXHIBIT 2**

Source: Schedule AE-8

Two AREVA contracts are sole-source contracts, while a third resulted from competitive bidding. Combined, the three AREVA contracts total less than the Siemens contract. AREVA has a long history of involvement in the plant.<sup>5</sup> The largest of AREVA's contracts is for Nuclear Steam Supply Systems engineering, fuel engineering and License Amendment Request support. Due to its familiarity with the CR3 Nuclear Steam Supply System design and safety analysis, PEF project management considered them more qualified for this work than any other vendor. The second largest AREVA contract is for balance of plant engineering work. An RFP was issued for this contract, and AREVA was selected based upon detailed assessments of the capabilities of the three bidders. Evaluation criteria included experience with similar projects and staff capabilities. PEF analysis of the bids and proposals received indicated AREVA was the most capable and its selection would reduce project risk. The third and smallest AREVA contract was also a sole source award for engineering design of the measurement uncertainty work completed in late 2007. This award was also based upon AREVA's ownership of the CR3 design and safety analysis.

<sup>5</sup> AREVA NP purchased Babcock & Wilcox and its original CR3 NSSS design.

The Thermal Engineering and Yuba contracts were competitively bid, and in both instances, provided lower cost options than competitors. The remaining contracts of one million dollars or more are with NuFlo Technologies and Atlantic Group. Both were sole-source awards under existing Master Contracts for the Progress Energy nuclear fleet and provide installation labor. The Atlantic contract had been competitively bid and prior work for Progress Energy indicated a high degree of qualification. According to PEF, the NuFlo contract was based upon [REDACTED] and the use of an existing contract allowed the tight timetable for the 2007 outage work to be met.

**PEF appears to have followed its contractor selection procedures. Given the unique challenges and circumstances of the nuclear industry, PEF's use of sole source selections for the CR3 uprate project to date is in keeping with reasonable business practices.**

**Is an appropriate set of internal controls for contractor management and evaluation in place for the CR3 uprate project?**

As noted, PEF management believes that contractor management is critical to the success of the uprate project. Staff agrees that without adequate contractor internal controls and oversight, a greater possibility exists for mistakes, schedule delays, and cost overruns. Within the Nuclear Projects and Construction Department, contractor oversight is the responsibility of the Power Uprate Project Manager. His work group is also responsible for fabrication oversight as old components are removed, and as new ones are staged and installed on site. Since this group also has engineering and design responsibilities for much of the uprate work, its oversight of contractors to maintain design conformance is appropriate.

PEF's contract administration procedures require daily communication between PEF and the contractor. Work progression is to be tracked and logged in the contract file. Deficiencies are to be noted and promptly reported to line management within PEF.<sup>6</sup>

Contractor evaluation will also be accomplished through the activities of the Nuclear Assessment Section for the CR3 plant. To provide stronger independence, this section's reporting line is being changed so that it reports outside of PEF to Progress Energy Corporation's Nuclear Oversight Vice-President, and ultimately to Progress' Chief Nuclear Officer. However, for project communication, the Nuclear Assessment Section's superintendent has a matrix reporting relationship to the Vice-President – NP&C. The Nuclear Assessment Section evaluates both internal plant work by PEF and external work by contractors.

In some instances, Progress Energy's Audit Services Department and Performance Evaluation Section both have a role in contractor evaluation. The full responsibilities of these organizations are discussed in more detail in section 2.5 below.

**PEF's efforts to secure an engineering, procurement, and construction contract appear to have been effective and appropriate. The basic structure of the Letter of Intent regarding engineering, procurement, and construction services appears reasonable.**

<sup>6</sup> Progress Energy Procedure MCP-NGGC-0001, p. 24.

## **Has PEF implemented appropriate protections from contractor cost overruns or poor performance on the CR3 uprate project?**

PEF project management has stressed that effective supervision and management of contractors must be maintained to avoid schedule delays or cost overruns. The company states that contracts have been negotiated to support this effort. A primary objective of CR3 project management has been negotiating fixed price contracts. With the total payment limited to a not-to-exceed amount, contractors place their profit margin at risk should the work progress lag or even exceed the estimate upon which bids were based. This risk-sharing approach prevents contractors from benefitting from failures to meet deadlines. All of the eight CR3 contracts exceeding one million dollars are [REDACTED]

Other contract provisions provide [REDACTED]

Standard contract provisions cover contingencies such as damages, breach, work stoppages, cancellation for cause or without cause by PEF, and dispute resolution to ensure quality work and contract adherence. Each contract specifies audit and work inspection rights for PEF.

**PEF has made efforts to ensure effective contractor performance by means of protective contract provisions and contract structure. This approach appears to have appropriately sought risk sharing through incentives and penalties.**

## **2.5 Auditing and Quality Assurance**

### **Does PEF have appropriate auditing and quality assurance functions in place for the CR3 uprate project?**

Major projects such as the CR3 uprate and the Levy units will be the subjects of the Progress Energy Corporation's Audit Services Department since they represent a substantial investment and therefore risk to the company. Appropriately, the Audit Services Department is headed by a Vice-President who is accountable to the Progress Board of Directors' Audit Committee. This allows the organization to provide independent assessments of procedural adherence and adequacy of internal controls on company operations and activities such as the CR3 uprate.

An audit of the CR3 uprate project was conducted in late 2007 by Audit Services. Its scope included assessing the effectiveness of project management, cost management, and project accounting practices related to the CR3 project. The December 28, 2007 audit report was entitled

*Audit of Crystal River 3 Extended Power Uprate Project.* Exceptions were noted in five areas. Corrective actions, where applicable, were implemented by the end of March 2008.

Findings relevant to FPSC audit staff's review were noted in the areas of [REDACTED]. [REDACTED] These findings were relatively minor. However, continued attention to the areas cited will be required in future years for effective project management. [REDACTED]

Appropriately, a follow-up to the 2007 CR3 audit is planned for the third quarter of 2008. Audit Services plans to re-audit the areas from the first audit. The scope is not finalized but will likely assess adherence to key written procedures governing project planning and project management. The audit may also evaluate the adequacy of budget metrics, delineation of roles and responsibilities, and implementation of lessons learned.

Progress Energy's newly-formed Project Assurance Group was created to provide an internal review of project decision-making processes by ensuring that proper procedural adherence and documentation are maintained. In carrying out this function, the group's efforts are intended to support PEF's nuclear cost recovery filings. This group ultimately reports to the Progress Energy Vice-President of Audit Services, and though it does not perform audit function, it will provide monthly feedback to both project management and corporate management. According to PEF, the staffing of this function is still in progress, and basic policies and procedures are in place.

Within Progress Energy Corporation's Nuclear Generation Group, the Performance Evaluation Section performs reviews of major projects such as the CR3 uprate. The Performance Evaluation Section also performs cross-functional reviews of CR3 plant operations and management-directed reviews. During 2008, Progress Energy began reorganization of the structure of the Performance Evaluation section and other internal assessment functions. This restructuring will be delineated in an Internal Governance procedure that is currently under development.

An internal quality assurance auditing role is also performed by the CR3 Nuclear Assessment Section. This group performs contractor and internal PEF reviews of Crystal River Unit 3 operations, including some related to the uprate project. During 2009, the Performance Evaluation section will conduct its biennial review of the CR3 Nuclear Assessment Section.

In future years, audit staff expects to see increasingly frequent audit activity. Quality assurance audits and internal audits should provide adequate depth and breadth of coverage to support the company's cost recovery filings by documenting adequacy of internal controls, adherence to procedures, and reasonableness of project management efforts.

**PEF's audit and quality assurance capabilities are appropriate. At this early stage, audit coverage appears adequate. These controls have already proven their value in encouraging adherence to procedures. As the project progresses, more frequent internal audits and quality assurance audits will be necessary for the success of the Crystal River 3 uprate project.**





## 3.0 Levy Units 1 and 2 Construction Project

### 3.1 Project Planning

#### Were the site selection and land purchases for the Levy units reasonable?

PEF performed an extensive search for potential sites for its planned nuclear units. The company employed the *EPRI Siting Guide*, a site selection process developed by the Electric Power Research Institute for use by electric utilities in siting plants.

The process followed by PEF ranked potential sites in three major categories and sub-categories:

- ◆ Technical Evaluation
  - ▶ engineering costs
  - ▶ socioeconomics
  - ▶ environmental concerns
  
- ◆ Strategic Considerations
  - ▶ system reliability
  - ▶ site permitting
  - ▶ weather vulnerability
  - ▶ advantages of existing plant site
  - ▶ local government support
  - ▶ additional cost considerations
  - ▶ site expandability
  
- ◆ Transmission Factors
  - ▶ cost
  - ▶ connection issues

More than 20 potential sites were studied by PEF, and these evaluation criteria narrowed these to five candidate sites located in Putnam, Highlands, Dixie, and Levy counties, plus the existing Crystal River site. These were all examined through a quantitative scoring process. Of these, the Crystal River site and the Levy site emerged as the highest scored options.

The Crystal River and Levy sites were evaluated highest on the technical evaluation category due in large part to having more solid limestone located closer to the surface, and due to water source considerations. The other three sites would have relied upon river water which could have created environmental concerns and competition with other users. The Levy site had an elevation advantage of an additional 35 feet above sea level, reducing vulnerability to hurricane storm surges.

The strategic considerations evaluation resulted in an advantage for the Levy site over the Crystal River site since Levy would have lower vulnerability to a major generation loss from a single event in a geographical area.

PEF's results indicate Levy was predicted to have slightly higher transmission upgrade costs than Crystal River. Projected transmission costs for the Dixie county site were slightly higher than the Levy county site.

In total, the Levy site received the highest ranking, with Crystal River second and Dixie county third. The Highlands and Putnam sites were considerably less viable.

The site itself is largely comprised of two parcels, each named for the previous owner(s). In November 2006, PEF signed a purchase agreement for the 3,105 acre Rayonier property. In October 2007, PEF contracted to also purchase the bordering 2,159 acre Lybass property. The latter parcel provides access to the Cross-Florida Barge Canal for cooling water intake. It also provides transmission exits from the plant site.

To prevent potential sellers from attempting to leverage higher sales prices, PEF engaged a realtor to represent the company in these purchases. The realtor did not disclose that PEF was the potential buyer, but approached each owner to inquire about price and availability.

Initially, asking prices were high. A reduced price on the Rayonier property was agreed to, and the company considered using only the Rayonier property for the plant. [REDACTED]

The size of the combined property exceeds the actual core plant site. Project management indicates that this provides the required buffers and also space for future expansion. The site could accommodate either more nuclear units or other generation technologies. At least one owner would not divide the property to purchase fewer acres. In making its decisions to purchase, PEF reasoned that the increasing scarcity and prices of suitable plant sites also warranted the purchase of the parcels.

Transmission corridors were planned with several options being considered until plant site selection was finalized. In 2007 a contract was awarded to Golder Associates to identify and evaluate transmission corridors needed and to assist with development of initial land cost estimates. The report was issued in 2008, and it recommended transmission corridor locations that are still under consideration by PEF.

Examination of environmental impacts and coordination with local government and public interest citizen groups proceeded, and the selected routes and corridors were announced in conjunction with the company's FPSC Need Determination filing. The company plans to begin transmission land and rights-of-way acquisition once the route selection study is complete.

PEF project management indicated that the proximity of the Levy and Crystal River sites was not a serious concern. Though just eight miles apart, the distance between Crystal River Unit 3 and Levy Unit 1 would be greater than that separating all the twin-unit nuclear plants in operation around the country. Based upon audit staff's understanding of the NRC's site selection constraints, this analysis of the risk of two additional nuclear units on the Levy site appears reasonable. Regarding site selection involving multiple units, the NRC requires the utility to determine whether the reactors are independent to the extent that an accident in one reactor would not cause an accident in another, and to show that simultaneous operation of multiple reactors will not result in total radioactive releases beyond allowable limits.<sup>7</sup>

**PEF's site selection and acquisition efforts appear to have been appropriate and in keeping with good business practices.**

### **Was the process for selection of the Levy units' design reasonable?**

The Levy project dates back at least to 2004 when PEF joined the NuStart consortium. As the name implies, NuStart was formed to pursue a "new start" for the United States nuclear industry. NuStart's members are utilities exploring possible nuclear unit construction. The consortium has worked with the NRC and U.S. Department of Energy to gain approval for two demonstration project sites under the previously untested NRC combined operating license application process (COLA). For these initial demonstration projects, NuStart submitted applications for two advanced nuclear plant designs: the Westinghouse AP1000 and the GE Economic Simplified Boiling Water Reactor (ESBWR). The development of the AP1000 COLA by NuStart allows all member companies to use the portions of the COLA that are generic to these plants in their own applications. This reduces the COLA workload and expense for companies selecting the AP1000 design.

During 2005, Progress Energy issued a Request for Proposal (RFP) to GE, Westinghouse, and AREVA to obtain plant design proposals. In 2007, Progress Energy joined the AP1000 Operators Group (APOG), a consortium of utilities considering construction of an AP1000 plant. This group sought to reap benefits from combined research efforts, standardization, and resource sharing.

The evaluation of RFP responses and other research culminated in PEF's selection of the AP1000 design in early 2006. Monitoring of other design options continued, and PEF assessed GE's Advanced Boiling Water Reactor (ABWR). But the Westinghouse AP1000 remained PEF's preferred technology. The company believes the fact that the AP1000 has attained Design Certification from the NRC provided a major advantage over other options not yet granted this status. The analysis of the plant design options focused the following key criteria:

- meeting PEF's targeted commercial operation date
- ◆ minimizing capital expenditure and busbar costs

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<sup>7</sup> Title 10 Code of Federal Regulations 100.11.

- ◆ avoiding design options rejected by all other U.S. utilities
- ◆ minimizing financial risk, schedule risk, and expected licensing path duration
- ◆ maintaining compatibility with PEF's system operation and transmission capabilities.

The technology selection was made by the Baseload Steering Committee, comprised of key senior managers, and was approved by company and corporate executive management. The Progress Energy Board of Directors concurred with the selection approved by company and corporate executive management.

The company's early involvement in studying technology options placed PEF in a favorable position among the 21 planned new U.S. nuclear units. Should congestion in processing applications at NRC materialize, the benefits of PEF's position in queue may become more apparent and more valuable.

**PEF's plant design selection process was reasonable and effective in positioning the company to meet the anticipated need for capacity in 2016.**

### **Is PEF's approach to negotiating an engineering, procurement, and construction contract for the Levy units reasonable?**

To support its AP1000 unit design, Westinghouse has teamed with Shaw Stone & Webster to form a consortium that offers full Engineering, Procurement and Construction (EPC) services. This is intended to provide more coordinated and efficient engineering and construction services within a unified contracting team.

Currently, the Westinghouse team is constructing the first AP1000 units in China. This provides a potential benefit in several ways for PEF and other AP1000 owners, as Westinghouse and Shaw Stone & Webster develop a cooperative interaction in completing one plant before repeating the process in the United States. This also allows the U.S. plants to benefit from lessons learned on the China plant.

However, the "package deal" of Westinghouse – Shaw Stone & Webster, and the popularity of the AP1000 could result in these suppliers being able to command a higher price for their unique combined offer. Therefore, PEF management sought to carefully consider its selection of an EPC contractor, keeping its options open to contract separately for engineering and procurement services from Westinghouse, and construction services from a provider other than Shaw Stone & Webster.

In March 2008, PEF entered into a Letter of Intent with Westinghouse – Shaw Stone & Webster to obtain key elements of the EPC services package for the Levy units. This agreement involved four key elements:

[REDACTED]

[REDACTED]

Audit staff notes that the industry-wide desire to keep sensitive negotiations confidential (including price specifics) makes it difficult to develop a frame of reference for evaluating the PEF Letter of Intent. Still, PEF management believes it has negotiated the most favorable terms possible given current market conditions, and points out that [REDACTED]

Among factors to be considered by PEF are the advantages of opting for the Westinghouse – Shaw Stone & Webster package contract. These include streamlining the selection of another construction contractor and the resulting coordination between that contractor and Westinghouse.

**PEF's efforts to secure an engineering, procurement, and construction contract appear to have been effective and reasonable. The basic structure of the Letter of Intent regarding engineering, procurement, and construction services appears reasonable.**

### **What regulatory approvals are required for completion of the project?**

Florida Public Service Commission approval for the Levy Units is being addressed as required by Sections 403.507(4) and 403.519(3), Florida Statutes. The Commission's decision on the Determination of Need proceeding, Docket No. 080148-EI was pending at the time of this report.

Florida Department of Environmental Protection (DEP) approval for the Levy Units must be obtained via the Site Certification Application process. As with the CR3 uprate approval, DEP will coordinate with other state and local agencies to assess public health and environmental aspects of the planned Levy units. These activities include coordinating with the state's Water Management Districts in reviewing the Environmental Resource Permit application, and reviewing wetlands mitigation plans.

The company submitted its Site Certification application in early June 2008. Certification will be decided by the Siting Board (Governor and Cabinet), or in a non-contested case by the Secretary of the Department of Environmental Protection on behalf of the Board. The approval process is estimated by the company to require 15 or more months, and it will run concurrently with the much longer NRC combined operating license approval process.

PEF is required to submit license applications for NRC approval both for new unit construction and operation. The company has elected to use the Combined Operating License process option offered by the NRC. This process combines the applications for both the construction license and the operating license, with the intent of reaching an earlier completion date than the available two step process.

In 2006, the company engaged a Joint Venture Team of three contractors (Sargent & Lundy, Worley-Parsons, and CH2M Hill) to prepare its Combined Operating License Application (COLA) and DEP Site Certification Application. The team's COLA and Site Certification Application work is being completed. PEF states that the DEP Site Certification Application was submitted on June 2, 2008, and that the COLA will be submitted on July 30, 2008. Appropriately, PEF has maintained quality assurance and audit oversight of the Joint Venture Team's work. Additionally, the company has developed extensive written procedures to govern its review of the COLA.

PEF plans to apply to the NRC for a Limited Work Authorization at the same time the COLA is submitted. This will allow for limited site preparation activities in advance of issuance of a combined license. PEF project management believes this site preparation work could begin in 2010, and it should be completed in time to support commencement of construction in early 2012.

Once approval is granted for the COLA, the NRC maintains oversight of the construction and operation of the unit facility throughout its lifetime to assure compliance with the Commission's regulations. After issuing the combined license, the NRC will authorize operation of the facility upon verifying that the licensee completed required inspections, tests, analyses and that acceptance criteria were met.

**PEF has appropriately proceeded with the required regulatory approvals, scheduling, and preparation of applications in a manner that will accommodate the planned project completion dates.**

**Has PEF developed a project plan to meet the desired project completion dates?**

Based upon the anticipated regulatory approval schedule, the ongoing engineering and procurement efforts, PEF developed the current schedule leading to anticipated Levy Unit 1 commercial operation in 2016. In 2006, the company approved a project plan for the Levy project COLA phase, including a Work Breakdown Structure. The COLA phase includes the

selection of the reactor technology design, site selection, and preparation and post-submittal support of the license application itself.

COLA completion and submittal is planned for late July 2008. As of mid-June the COLA work was reported to be about 90 percent complete. PEF believes NRC approval of the Levy COLA could be completed in early 2012, triggering the start of safety-related construction. Four years of construction and pre-operational testing are planned to be completed by the end of 2016.

Levy Unit 2 construction is planned to lag Unit 1 by about 12 to 18 months, allowing contractors and workers to transition from one unit to the other. This approach reduces efforts related to setup time, contractor workforce qualification and recruitment, and maximizes the use of cranes and other leased equipment. Development of a detailed project plan and Work Breakdown Structure for the construction phases of the Levy project is in progress.

Project management has stressed the value of work on both units employing modular construction techniques. PEF notes modular construction has been successfully employed in recent years in overseas nuclear unit construction. Compared to the nuclear unit construction techniques of the 1970s and 1980s, this method compresses construction time, simplifies material handling and purchasing, and allows progress in different project areas to proceed on parallel tracks.

As with the CR3 uprate project, one key element in scheduling the Levy units is the handling of long lead items. As noted, PEF's plant design technology selection had to begin early in order to provide a favorable position "in queue" versus other planned units nationwide. The signing of the March 2008 Letter of Intent with Westinghouse – Shaw Stone & Webster allowed the procurement of key long lead items to begin, further securing PEF's "place in line" and increasing its chances of meeting the targeted Levy completion date. Westinghouse has developed and delivered a preliminary integrated project schedule for the Levy project. This schedule is under review by PEF management and will be integrated into a formal Integrated Master Plan.

**PEF appears to have taken a reasonable approach to developing project plans at this early stage.**

### **Was PEF's risk evaluation for the Levy project reasonable?**

As noted, at the time PEF began to pursue the Levy plant option, its procedures regarding major capital projects (those in excess of \$5 million) required the new plant to be proposed via a Business Analysis Package (BAP). This document laid out the basic schedule, cost estimates, risk analyses, economic analyses, and scenario analyses for the COLA process only.

Risks assessed for the COLA phase included the following:

- ◆ Construction cost escalation
- ◆ Fuel cost escalation



- ◆ Contractor non-performance
- ◆ Carbon tax legislation

The initial BAP, presented in March 2006, presented the option of pursuing COLAs for both the Levy project and separate units to serve Progress Energy-Carolina. This analysis noted several future decision points for re-evaluation of whether a new nuclear plant was the best base load generation option. These re-evaluations were recommended to be performed at the points of ordering long lead equipment, COLA submittal, and start of on-site construction.

A revised BAP in August 2007 reflected slightly later planned dates for COLA submission and approval by the NRC. It also reflected an increased project cost estimate due to higher land purchase costs. The revisions also reflected revised capacity need dates for the Carolina and Florida units. The Florida timeframe moved from 2015-2016 to 2016-2018.

Specific risks analyzed included variation in the construction costs, fuel costs, and environmental costs. The only activity risk was the chance of non-performance by the COLA consultants, which was covered by contract provisions. An economic analysis compared costs of alternative generation options modeled under various scenarios. A best case scenario examined included the impact of carbon taxes that would favor the nuclear option. A worst case scenario assessed the impact of reduced natural gas prices and a 20 percent increase in capital costs.

The conclusion was that nuclear was competitive with other options, and to protect that option, PEF should start the nuclear licensing process to allow future reconsideration of the Levy plant option. It reiterated the re-evaluation decision points specified above.

During 2008, PEF began to migrate major projects towards its new Integrated Project Plan (IPP) for approval and control. The IPP process still includes the identification and assessment of key risks and risk management approaches, but provides senior management with more frequent and continuing opportunities to endorse or redirect the project. Like the BAP, the IPP documents assumptions, constraints and decisions to be made, defines approval requirements for funding, and it provides a baseline for the progress measurement and project control.

Risks addressed in the 2008 revised BAP included the following:

- ◆ Interest rate escalation
- Component cost escalation
- Construction cost escalation
- Contractor non-performance
- ◆ Labor shortages

The second revision of the Levy Business Analysis Package was presented in April 2008. This revision addresses the decision to move forward with the project beyond the COLA phase. It added information regarding the provisions of the Letter of Intent, and assigned primary responsibility for the project to the Nuclear Projects and Construction Department, as well as support roles to various PEF and Progress Energy departments. The analysis included results using the Strategist© modeling tool. Model runs examined sensitivities to various fuel price

projections and assumptions regarding potential CO<sub>2</sub> legislation. Also examined were lifetime costs of Levy and other generation options.

Key risks addressed include price risks including increased interest rates and increased component fabrication and construction costs. The plan stated that mitigation of interest rate risk could be provided by PEF Treasury Department, and also through seeking annual AFUDC recovery by the Commission. Component and construction costs were anticipated to stabilize design finalization is completed in 2009. These risks had already been mitigated by locked-in pricing and the reserved position in queue provided by the Letter of Intent. An additional strategy identified was the use of hedging for key commodities. Fuel cost risks and construction costs could be offset by hedging uranium or other commodities.

The analysis noted that risks related to non-performance by the EPC contractors were addressed in contract terms and conditions, and they could be mitigated by evaluating use of a replacement firm. Another risk was a potential shortage of labor and craftsmen. The company plans to address this through outreach programs to technical schools, community colleges and the University of Florida to support the preparation of capable technicians and engineers.

The 2008 BAP reaffirmed the need for PEF to continue to reassess the viability of the project. The report stated, "As the nuclear generation project continues forward, PEF will continue to monitor and will be obligated to demonstrate the prudence of pursuing nuclear generation as opposed to other viable options to meet the reliability needs of the Company's customers."<sup>8</sup> Beyond the risk analyses completed to date, audit staff believes PEF will need to act upon the recommendations of the three Levy Business Analysis Packages to re-examine the project at key dates such as the time of COLA submittal and the start of construction.

Concerns regarding the availability of manufacturers and contractors prompted the company to maintain an accelerated contract award process. Though a final EPC contract has yet to be signed this effort took a large step towards that milestone with the Letter of Intent with Westinghouse – Shaw Stone & Webster. PEF projects that an EPC contract will be signed in mid-2008.

The resurgence of the U.S. nuclear industry has already impacted the NRC as it processes the numerous license applications that will be involved. Presently, PEF anticipates an approval period of 42 to 48 months after submission of its Levy uprate application in mid-2008. PEF management has viewed submitting an early application as being essential to reducing schedule risk, and it has acted to carry out this priority. Staff believes that backlog issues at the NRC are beyond the company's control, and early application with a well-prepared COLA is the only viable countermeasure. Also, the company must provide timely responses to any Requests for Additional Information generated by the NRC. At present, PEF project management believes the company's NRC application efforts and schedule should produce approvals without delays to project completion.

**PEF has conducted a reasonable identification and assessment of potential risks to successful completion of the Levy project. Project cost and schedule success will require**

<sup>8</sup> *Business Analysis Package - Revision 2*, April 4, 2008, p 35.

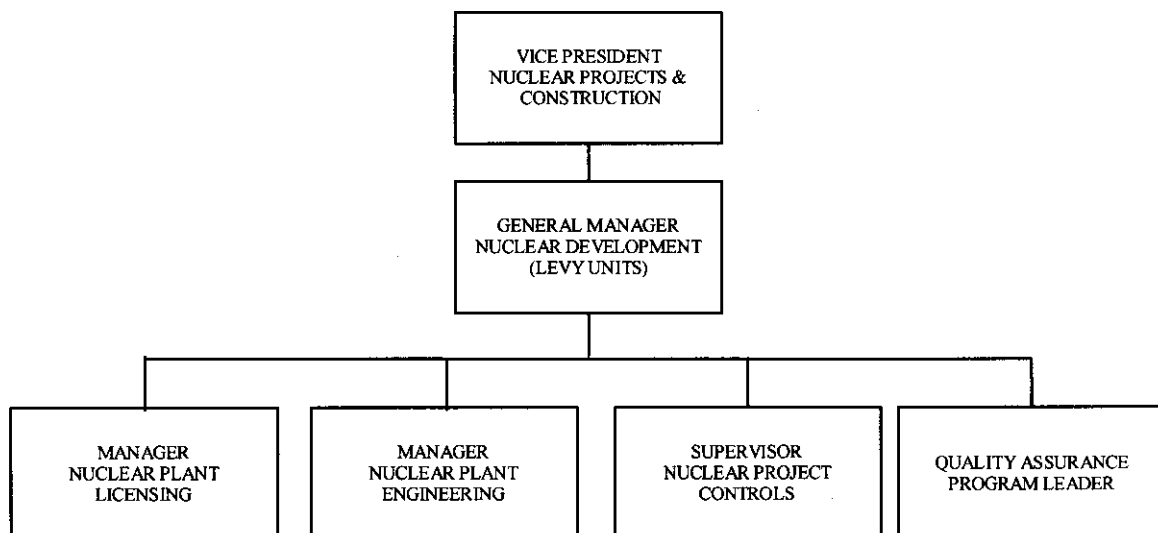
continued vigilance in risk management and re-assessment of project viability at key decision points.

### 3.2 Project Management and Organization

**Is an appropriate project management organization in place for the Levy project?**

As with the CR3 uprate, the recently-created Nuclear Projects and Construction Department will provide a dedicated staff to oversee the Levy project. Headed by its Vice-President, who serves as the Levy project sponsor, this department will have primary responsibility for development of the Levy site and the construction of the units. To date, most of the activities surrounding the COLA preparation and site selection have been managed by the Nuclear Plant Development section, which is depicted in **Exhibit 3**.

#### PEF Nuclear Plant Development and License Renewal



**EXHIBIT 3**

*Source: PEF Response to Document Request 3-4*

The Nuclear Project and Construction Department and the Nuclear Plant Development section have both developed written procedures to guide its work in the Levy project. Due to the ongoing nature of the project, portions of these procedures are still in the process of development, particularly those pertinent to activity scheduled for future years. Where applicable, general PEF procedures still govern. Staff has obtained and reviewed a sample of these procedures for appropriateness and completeness.

**Effective oversight of the Levy project by PEF's Nuclear Projects and Construction organization will be an essential element to the project's success. Though still being staffed, the organization appears to be appropriately structured and managed at this time.**

**Are appropriate oversight and accountability controls over project management in place?**

As noted, the reporting structure within the Nuclear Projects and Construction Department provides checks and balances to maintain oversight of work and independent assessment of work quality. This is accomplished through a variety of regular and ad-hoc meetings and reports. Properly structured and used, these reporting tools prevent actual or emerging problems from worsening due to lack of detection or intentional cover-up.

The regularly scheduled meetings involve varying segments of Levy project management. The Vice-President – Nuclear Projects and Construction convenes daily, weekly and monthly meetings with project managers of varying levels. As needed, meetings for time-sensitive issues are conducted as needed. Management receives schedule and cost reports on a regular basis to evaluate specifics of progress in either area. According to project management, meetings with PEF senior have been held monthly regarding the negotiation of the overall engineering, procurement, and construction contract.

Each quarter the Vice-President – Nuclear Projects and Construction participates in a meeting chaired by the PEF Chief Executive Officer. This meeting provides an opportunity to inform the CEO on project status and to answer his questions or concerns. Additional updates and presentations are provided to the CEO on request.

Levy project management provides a quarterly briefing and presentation to the Chief Nuclear Officer. A detailed presentation on the status of work is made by project management, highlighting changes to plans, current challenges, proposed resolutions and decisions needed.

Quarterly updates on the project are held with senior management. Future review of the project will be conducted under the Integrated Project Plan process (IPP) which was adopted in 2008. Project progress is tracked against the Integrated Project Plan and budget performance is examined. These IPP meetings in effect provide senior management with opportunities to authorize continued work, or if warranted, to suspend the project. In the event that severe problems emerged, this mechanism could provide PEF an “off-ramp” from the project.

Project management also meets quarterly with the PEF Finance Committee. These meetings examine the budget status and assess cash flows and the need for additional capital.

**A framework for adequate oversight of project management by senior management exists. Plans for communications within the project management organization appear to be appropriate at this time.**

### 3.3 Cost and Schedule Monitoring Controls

#### **Has PEF developed an adequate control system for monitoring project schedules and costs?**

As noted, the Project Controls group within the Nuclear Plant Development section is dedicated to the cost and schedule tracking of the Levy project. The Project Controls group can be viewed as the first line of defense for detecting emerging problems with costs and schedules. Once detected, any concerns can be further evaluated by Project Controls and/or brought to the attention for analysis by the on-site managers involved.

PEF's primary scheduling and schedule tracking tool is Artemis/ProjectView, a widely used project tracking and scheduling system. Through Artemis/ProjectView, actual versus projected schedule variances can be identified, analyzed, and recovery plans developed. Regular periodic reports can be provided to management, and customized reports can be developed as requested.

The company is currently reviewing a preliminary integrated project schedule prepared by Westinghouse. This schedule is under review by PEF, and it will be integrated into a formal Integrated Master Plan.

The Work Breakdown Structure is another key component of the project plan for the construction phase of the Levy project. It is the detailed plan by which each work activity for the project is identified, assigned and sequenced. Each of the hundreds of specific tasks is assigned to a functional area manager and also to a specific task manager. The functional area manager is responsible for development of the task instructions and procedures for its completion, and the task manager is responsible for actual task completion.

Cost and schedule tracking to date have focused on the COLA work. As of June 2008 the COLA is 90 percent complete, and PEF management states it plans for submittal to the NRC in late July 2008 can be accomplished. Costs for the COLA work have increased due to approved scope additions since 2006.

Monthly reports from contractors and PEF project staff also provide detailed information indicating work progress, schedule status, expenditure summaries and other information indicative of performance. Since 2006, the Joint Venture Team has provided monthly Levy plant COLA status reports and periodic Site Certification Application status reports. These contain work status information, which indicates the percentage of work complete.

PEF and Progress Energy also provide periodic internal reports on the Levy project. Progress' Nuclear Plant Development section provides a monthly Performance Report. The reports discuss cost and schedule status, budget variance, key issues and decisions, upcoming events, and self-evaluation results. Periodic briefing reports are also prepared for the Progress Energy Chief Nuclear Officer. They present updates on project status, highlight emerging challenges and problems, and discuss budget considerations.

Monthly cost reports and financial summaries are provided to PEF business unit managers and executives. Similarly, project cost reports detailing the transactions charged to the project are provided to project managers. PEF indicates that similar monthly information is provided to the Chief Operating Officer and other senior management committee members.

As the project progresses into pre-construction and eventually construction phases, cost tracking will become an increasingly important activity. Cost status is also provided in the purchase order and invoicing process, where the Project Controls group examines each against the total contract and remaining authorized funds.

**Cost and schedule monitoring controls are still in the process of development. Limited results are available for assessing the adequacy of these controls at this time.**

### 3.4 Contractor Selection and Management

**Has PEF's selection of the current set of Levy project contractors and vendors been reasonable?**

As with the CR3 project, all vendors for the Levy Units are assessed for inclusion on PEF's Approved Supplier List. In the case of some contractors, long standing relationships have established a track record with PEF while first-time evaluations may be required for others. Depending upon the contract, this evaluation effort may include a review of the vendor's facilities, products, and quality assurance program.

Vendors and contractors for the Levy project were selected by a mix of competitive bidding and sole source contracts. PEF's procedures define sole sourcing as the selection of one single contractor, not on the basis that it is the only one qualified, but that it is the only one acceptable or available. Further, the procedures require sole source activity to be justified by the contract originator and approved at the appropriate management level for the dollar amount of expenditure involved.<sup>9</sup> Audit staff notes that in a sole source situation, a detailed proposal is still examined and revised to provide the services or products according to PEF's needs and constraints.

For the Levy project, PEF has entered into ten contracts of one million dollars or greater that are reflected in its cost recovery filings. Of these, two resulted from competitive bidding and eight were sole source awards. These contracts are summarized in **Exhibit 4** below.

The two contracts that were selected via bids were both awarded to the Joint Venture Team comprised of the firms of Sargent & Lundy, Worley-Parsons, and CH2M Hill. One contract was for the preparation of Levy's NRC COLA, and the other was for the preparation of the DEP Site Certification Application. The joint venture team was selected after evaluation of proposals from six bidders.

<sup>9</sup> Progress Energy Procedures MCP-NGGC-0001, pp. 8 and 20.

Of the sole source Levy project contracts, six were awarded to either Westinghouse or Shaw Stone & Webster. PEF notes that the selection of the AP1000 technology drove the selection of Westinghouse (the owner of the AP1000 design) and Shaw Stone & Webster (its partner for construction of AP1000 units). PEF could have elected to use a different construction contractor, but the potential advantages (discussed on section 3.1) appear to have been weighted heavily by the company in its decision process.

Levy Units 1 & 2 Project Contracts Greater Than \$1 Million			
Westinghouse	Letter of Intent - AP1000 Reactor design and components	Sole Source – based on reactor technology selected	[REDACTED]
Westinghouse	Levy price finalization support	Sole Source – based on reactor technology selected	[REDACTED]
Stone & Webster	Levy price finalization support	Sole Source – based on reactor technology selected	[REDACTED]
Stone & Webster	Letter of Intent - AP1000 reactor construction	Sole Source – based on reactor technology selected	[REDACTED]
Stone & Webster	Conceptual design and site characterization	Sole Source – based on reactor technology selected	[REDACTED]
Stone & Webster	Support of SCA and LWA submittals	Sole Source – based on reactor technology selected	[REDACTED]
Jt. Venture Team	COLA preparation	RFP	[REDACTED]
Jt. Venture Team	Site Certification Application preparation	RFP	[REDACTED]
Golder Associates	Transmission corridor studies	Sole Source	[REDACTED]
Power Engineers Inc	Transmission line and substation conceptual design	Sole Source	[REDACTED]

**EXHIBIT 4**

*Source: PEF Schedule AE-8*

The selection of the reactor design is arguably the most significant one to be made in nuclear plant construction. Its ramifications will continue for decades of plant operations. Due to the complete uniqueness of each design, and each vendor's ownership of that design, any technology selection necessarily will lead to a sole source award to that particular vendor. Audit staff believes this is a qualitative decision that does not lend itself to a low-bid selection process.

Though reactor designs vary, they can be separated into two basic types: pressurized water reactors (PWR) and boiling water reactors (BWR). The Westinghouse AP 1000, is a PWR, as is PEF's Crystal River Unit 3. Though the AP1000 is an advanced passive design and therefore significantly different from CR3, it is still similar to the basic technology type familiar to PEF and consistent with decades of operating experience at CR3. Other leading advanced designs being considered today are two separate General Electric BWR designs (ABWR and ESBWR.)

Another consideration weighed by PEF is the fact that unlike the GE ESBWR, the Westinghouse AP1000 and GE ABWR have attained design certification by the NRC. This is a designation granted by the NRC after a detailed engineering review. Though the GE ESBWR may attain the NRC certification, some delay would be required in PEF's timetable for COLA submittal in late July 2008 and commercial operation of Levy Unit 1 in 2016. The ABWR design was specifically studied and determined by PEF to be a less desirable option.

The design technology selection, however does not necessarily leave the utility without options for the construction contractor. For utilities selecting the AP1000, the consortium of Westinghouse – Shaw Stone & Webster strongly influences these companies to opt for the combined engineering, procurement and construction contract team. Concrete benefits for this option do exist. However, each utility's timing and planning assumptions differ and this certainly impacted PEF's decision-making.

PEF's goal to make a mid-2008 COLA submittal, both to avoid potential NRC and industry bottlenecks and to provide capacity by 2016, in part led it to strongly consider the Westinghouse and Shaw Stone & Webster team. Taking into consideration PEF management's efforts to obtain favorable pricing features in its March 2008 Letter of Intent, audit staff believes the Westinghouse and Shaw Stone & Webster sole source awards were reasonable decisions.

The sole source contract awarded to Golder Associates was for work supporting transmission expansion resulting from the Levy project. Key tasks include preparation of a corridor routing study and preparation of sections of the COLA and Site Certification applications. According to PEF management, the contract was sole sourced because Golder had already completed preliminary assessments for the Levy project in a prior contract. PEF reports that these preliminary assessments had been used as part of the decision to proceed with the project, but by the time the additional need for services existed, it was too late to issue an RFP for the other work. PEF believed issuing an RFP and analysis of proposals would have prevented the company from maintaining scheduled project milestones. PEF reasoned that if another contractor were selected, that contractor would have had to repeat the preliminary assessments work. The company also points out that it has a master contract with Golder that is exercised from time to time.

Similarly, the sole source contract awarded to Power Engineers Incorporated was for continued transmission line and substation conceptual design work as a follow-up to earlier work. The contract was awarded through a work authorization on a master contract with PEF. As with the Golder contract, PEF states that time constraints prevented the issuance of an RFP and that work already completed by Power Engineers would have to have been repeated if another vendor were to have been chosen.

Audit staff determined that the original preliminary assessments work contract with Golder was also sole sourced. Therefore, the justification for the second sole source contract depends largely upon the sole source justification of the first contract.



The compensation rates for both the Golder and Power Engineering contracts were based upon the existing master contracts in effect at the time. These rates were previously negotiated in an unhurried timeframe, and therefore the possibility of PEF having paid excessive work rates is diminished. Although it would have been preferable for the original work to have been competitively bid, the company's concern over schedule constraints appears reasonable to audit staff as sole source justification for both the Golder and Power Engineering contracts. In the future, audit staff urges the company to issue RFPs for project contracts where possible, and to plan to allow time for the selection process.

**PEF appears to have followed its contractor selection procedures. Given the unique challenges and circumstances of the nuclear industry, PEF's use of sole source selections for the Levy project to date is in keeping with reasonable business practices.**

### **Is an appropriate set of internal controls for contractor management and evaluation in place for the Levy project?**

The contractor management and contractor evaluation functions are the responsibility of the Nuclear Projects and Construction Department. Within the department's Nuclear Plant Development section, the Quality Assurance Program Leader oversees assessments of both vendor and PEF quality assurance programs. To date, he has interacted with the Joint Venture Team of COLA consultants, evaluating their efforts. As the project moves forward, he will develop the Levy QA program, writing the program procedures and staffing this group for an expanding workload.

Similar to the CR3 project, a separate Project Controls group within the Nuclear Plant Development section will oversee schedule monitoring and reporting, financial reporting and cost tracking, and work management. The aim of the Project Controls group is to detect and report emerging problems with costs and schedules. This reporting is essential to allow management to take timely action to prevent or control problems. The Project Controls Supervisor reports to the General Manager of Nuclear Plant development, who reports to the Vice-President – Nuclear Project and Construction.

At the corporate level, Progress Energy's Audit Services Department and Performance Evaluation Section both have roles in contractor evaluation. The full responsibilities of these organizations are discussed in more detail in section 3.5 below.

**PEF's approach to contractor oversight and evaluation appears to be appropriate to date. Proactive project management by PEF should require frequent communication and updates, demand contractor accountability, and challenge information provided by contractors.**

### **Has PEF implemented appropriate protections from contractor cost overruns or poor performance on the Levy project?**

PEF project management has stressed that effective supervision and management of contractors must be maintained to avoid schedule delays or cost overruns. The company notes that contracts have been negotiated to support this effort.

Where the nature of the work being performed does not lend itself to a fixed price contract, time and materials contracts can be structured to include a target price and penalty provision. [REDACTED]

[REDACTED] This risk-sharing approach prevents contractors from benefitting from their own failures, and it provides an incentive for early or timely completion of work. Of the current ten Levy contracts exceeding one million dollars, four are time and materials contracts and six are fixed-price.

As noted, required periodic status reports from contractors also are used as a tool for obtaining status information and accountability. This supports full disclosure and early detection of problems or negative trends. Contractors that are experiencing problems can provide remediation plans and commit to improved performance. Internal PEF and Progress Energy status reports previously described can also serve similar purposes of monitoring contractors' performance and effectiveness.

[REDACTED]

Standard contract provisions, cover contingencies such as damages, breach, work stoppages, cancellation for cause or without cause by PEF, and dispute resolution to ensure quality work and contract adherence. Each contract affords audit and work inspection rights to PEF.

**PEF has made efforts to ensure effective contractor performance by means of protective contract provisions and contract structure. This approach appears to have appropriately sought risk-sharing through incentives and penalties.**

### **3.5 Auditing and Quality Assurance**

**Does PEF have appropriate auditing and quality assurance functions in place for the Levy project?**

As a major investment facing various risks, the Levy project will continue to be the subject of the Progress Energy Corporation's Audit Services Department as it develops the annual audit plan. As noted, the Audit Services Department is headed by a Vice-President who is accountable to the Progress Board of Directors' Audit Committee. The reporting structure is in

keeping with Institute of Internal Auditors standards,<sup>10</sup> and it aids the organization in providing independent assessments of company operations such as the development of the Levy project.

Audit Services has planned several audits related to the Levy project for 2008. One will review compliance within PEF to the nuclear cost recovery rule including the accuracy and adequacy of filings. Another will assess the performance of the Levy Nuclear Financial and Regulatory Project Team, and a third will assess the adequacy of the Levy County Data Repository.

Most importantly, PEF's planned 2008 *Audit of Levy County Project Management* will address cost management, project management and adherence to authorization procedures. The audit will focus on governance and controls for overall project management, prudence, regulatory filings and reporting, status reporting, and change management. Audit staff believes the results of this audit will provide valuable input for assessing PEF's 2009 nuclear cost recovery filing.

Progress Energy's newly-formed Project Assurance Group was created to provide an internal review of project decision-making processes by ensuring that proper procedural adherence and documentation are maintained. In carrying out this function, the group's efforts are intended to support PEF's nuclear cost recovery filings. This group ultimately reports to the Progress Energy Vice-President of Audit Services, and though it does not perform audit function, it will provide monthly feedback to both project management and corporate management. According to PEF, the staffing of this function is still in progress, and basic policies and procedures are in place.

Within Progress Energy's Nuclear Generation Group, the Performance Evaluation Section also performs audits that examine PEF's nuclear operations, including the Levy Project. In 2008, PES is scheduled to perform an evaluation of the Nuclear Plant Development section, which includes the Levy project quality assurance and project controls functions. PES also performs cross-functional reviews of Progress Energy nuclear plant operations and management-directed reviews. During 2008, Progress Energy began reorganization of the structure of the Performance Evaluation section and other internal assessment functions. This change, and the benefits of the restructuring, will be delineated in an Internal Governance procedure that is currently under development.

During 2007, Nuclear Plant Development section's Quality Assurance group performed an audit of CH2M Hill, one of the Joint Venture Team contractors preparing the COLAs for both the PEF's Levy plant and the new Progress Energy-Carolina Harris units. [REDACTED]

[REDACTED] As a result, NPD required CH2M Hill to prepare a recovery plan to remedy these shortcomings. [REDACTED]

[REDACTED] The adverse audit findings triggered a review of CH2M Hill's geotechnical investigation activities at the Levy site by CR3's Nuclear Assessment staff. This review did not result in new findings, and no work stoppage was required at Levy. A re-audit of

<sup>10</sup> The Institute of Internal Auditors, *Standards for the Professional Practice of Internal Auditing*, 1995, Standard 110.01.1.

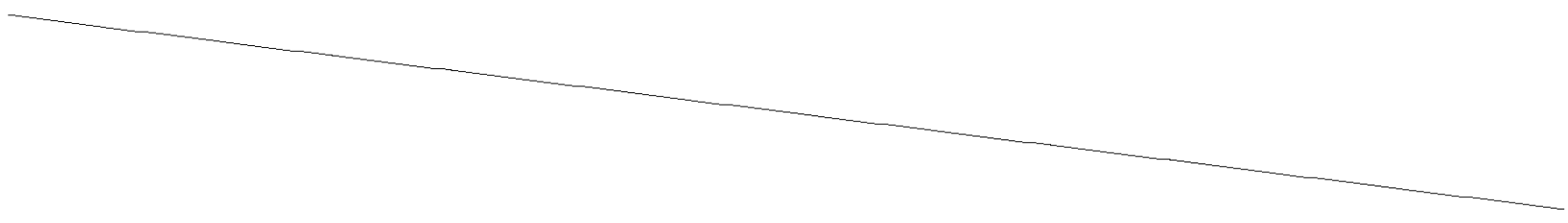
CH2M Hill was conducted March 31-April 4, 2008. The reaudit resulted in satisfactory findings, and [REDACTED]

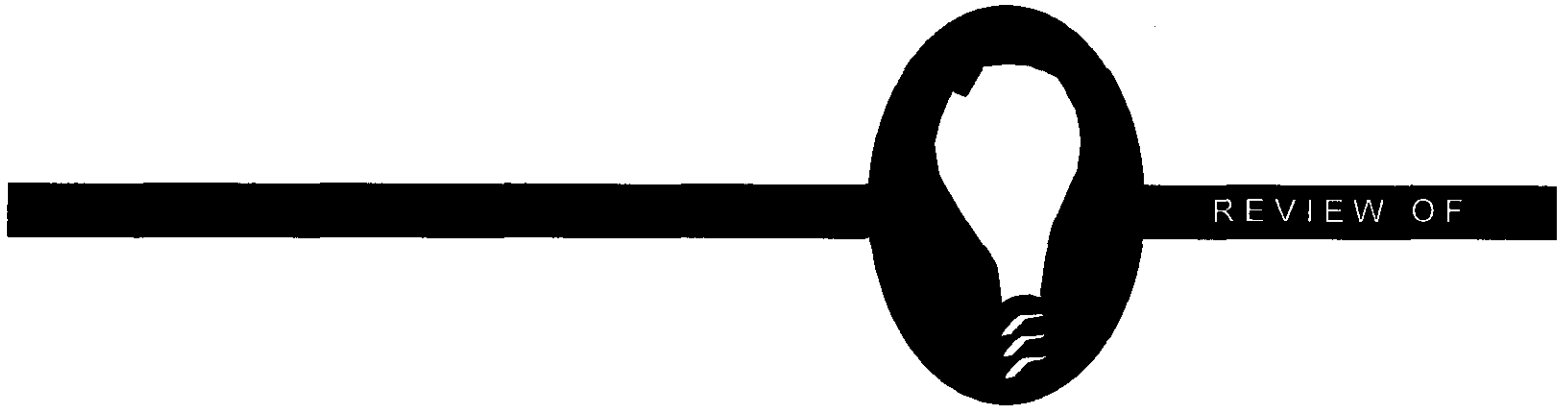
[REDACTED] In 2007, a similar audit of Joint Venture Team member Sargent & Lundy's quality program was conducted. This audit identified six nonconformances, none found to have an adverse impact on the product provided to Progress Energy.

The Quality Assurance group plans several internal Levy project reviews for 2008. Four reviews will separately address COLA Preparation and Review, Contract Management, Self Evaluation and Document Management. All are scheduled for completion during the second or third quarters of 2008.

In future years, audit staff expects to see increasingly frequent audit activity. Quality assurance audits and internal audits should provide adequate depth and breadth of coverage to support the company's cost recovery filings by documenting adequacy of internal controls, adherence to procedures, and reasonableness of project management efforts.

**PEF's audit and quality assurance capabilities are appropriate. At this early stage, audit coverage appears adequate. These controls have already proven their value in managing contractor effectiveness. As the project progresses, more frequent internal audits and quality assurance audits will be necessary for the successful completion of Levy Units 1 & 2.**

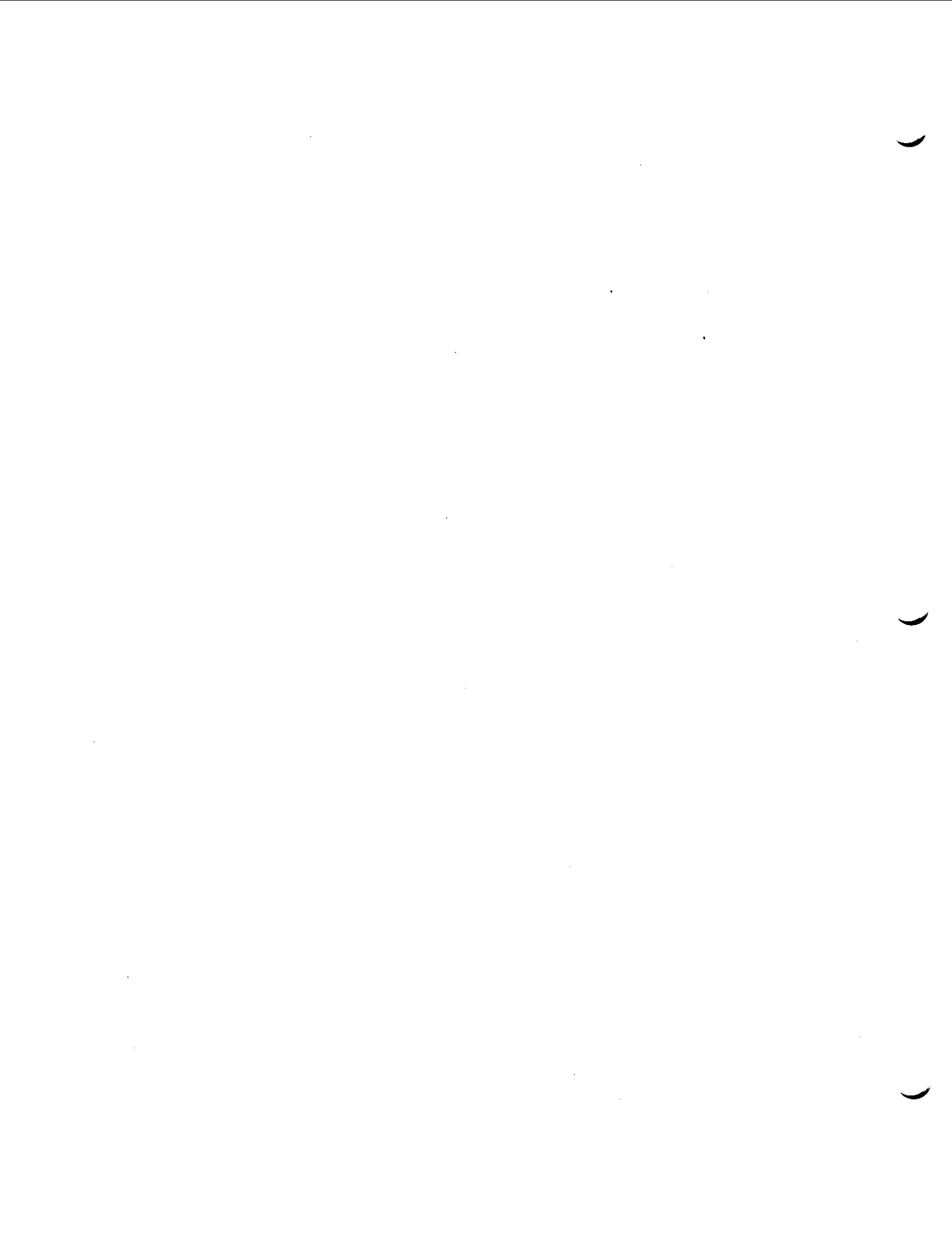




Florida Power & Light's  
Project Management  
Internal Controls  
FOR  
Nuclear Plant Upstate and  
Construction Projects

AUGUST 2008

By Authority of  
The State of Florida  
Public Service Commission  
Division of Regulatory Compliance  
Bureau of Performance Analysis



*Review of*  
Florida Power & Light's  
Project Management Internal Controls for  
Nuclear Plant Uprate and Construction Projects

Carl S. Vinson  
Public Utilities Supervisor  
and  
R. Lynn Fisher  
Government Analyst II

August 2008

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The State of Florida  
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PA-08-01-002





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## 1.0 Executive Summary

### 1.1 Purpose and Objectives

At the request of the Florida Public Service Commission's (Commission) Division of Economic Regulation, the Division of Regulatory Compliance conducted this review of the project management internal controls employed by Florida Power & Light Company (FPL) to execute the uprates of St. Lucie Units 1 & 2, Turkey Point Units 3 & 4, and the construction of Turkey Point Units 6 & 7.

The primary objective of this review was to document and evaluate the adequacy of project controls and internal controls the company has in place or plans to employ for these projects. The information and evaluations provided in this report are to be used by Division of Economic Regulation staff to assist in the assessment of the reasonableness of FPL's cost-recovery requests for the two projects.

### 1.2 Scope

The internal controls examined were those related to the following key areas of project activity:

- ◆ Project Planning
- ◆ Project Management and Organization
- ◆ Cost and Schedule Controls
- ◆ Contractor Selection and Contractor Management
- ◆ Auditing and Quality Assurance

Internal controls are the vital mechanisms by which company operations are managed to stay within budget and on schedule. According to the Institute of Internal Auditors' *Standards for the Professional Practice of Internal Auditing*, appropriate internal controls allow the organization to accomplish the following:

- ◆ Produce accurate and reliable data
- Comply with applicable laws and regulations
- ◆ Safeguard assets
- ◆ Employ resources efficiently
- ◆ Accomplish goals and objectives

Well-constructed internal controls assist with the challenges of risk management and decision-making. Risks must be identified and appropriate protections must be established to prevent or control these risks. Prudent decision-making results from orderly, well-defined processes that address known risks, needs, and capabilities. Adherence to written procedures, effective communication, vigilant contractor oversight, and ongoing auditing and quality assurance are all essential for ensuring that project costs are incurred prudently.

## 1.3 Methodology

Planning and research for this review were performed in January and February 2008. Data collection, site visits and interviews, analysis and report writing were conducted between March and June 2008. The information compiled in this report was gathered via company responses to staff document requests, visits to both the St. Lucie and the Turkey Point sites, and interviews with key project personnel. Staff also reviewed testimony, discovery and other filings in Docket Nos. 080009-EI, 070602-EI, and 070650-EI.

A large volume of information was collected and analyzed. Specific information collected from FPL included the following categories of documents:

- ◆ Company policies and procedures
- ◆ Organizational charts
- ◆ Requests for proposals
- ◆ Contractor bids and proposals
- ◆ FPL's bid evaluation analyses
- ◆ Project scope analysis studies by FPL and consultants
- ◆ Internal audit reports

Analysis of this information is discussed in detail in chapters 2 and 3.

## 1.4 Observations and Overall Opinion

The early stage of these projects limits audit staff's ability to draw final conclusions regarding some areas of controls that are in development or that will not to be deployed until later stages of the projects. Therefore, staff has examined only the completed portions of the project and internal control structure that are presently in place. Many of FPL's internal control systems are still in development and, will continue to evolve as the projects progress.

These internal control tools will ultimately determine the success of these projects, and the prudence of the company's actions. A complete determination of the reasonableness of the eventual control systems for management of these projects cannot be made at this time. Further, any assessment made at this point in time cannot be expected to remain valid for the entire duration of the project activities.

In any controls assessment, adequate controls may be in place at any point, but the ultimate proof of adequacy comes when the project work is actually performed. Beyond planning, the vast majority of the work of these projects has not yet been performed.

Further, though internal controls in place for any undertaking may be deemed adequate at the outset, it cannot ensure that they will be followed and used properly. Verification of adherence to procedures and careful examination of changes to control systems are essential ingredients to evaluating the reasonableness of management's actions. Audit staff believes continued internal and external oversight is necessary over the lifespan of these projects. Of

particular importance are internal audits and quality assurance audits. These audits should provide broad coverage of internal controls, procedural adherence, and project management issues.

The unique first-time nature of the 2008 nuclear cost recovery proceedings presented several challenges. Audit staff believes its review was limited in time and depth by schedule constraints in this first year of cost recovery filings.

### **1.4.1 St. Lucie and Turkey Point Uprate Project Observations**

Audit staff made the following observations for the key areas of activity it examined for the St. Lucie 1 & 2 and Turkey Point 3 & 4 uprates. The conclusions in each instance are subject to the limitations inherent in the information that was available to staff during March through June 2008.

#### **Project Planning**

- ◆ The FPL scope evaluation process appropriately provided technical and managerial evaluation of the risks, costs, benefits, and overall feasibility of the St. Lucie and Turkey Point uprate projects.
- ◆ FPL has appropriately proceeded with the required regulatory approvals, scheduling, and preparation of applications in a manner that will accommodate the planned project completion dates.
- ◆ FPL's approach to planning the uprate projects to date has been appropriate. Developing phase two and phase three project schedules will be critical to project planning.
- ◆ FPL has to date taken reasonable steps to identify, evaluate, and mitigate project risks. Successful project completion will require continued vigilance in risk management and re-assessment of project viability at key decision points.

#### **Project Management and Organization**

- ◆ Oversight of the uprate project by FPL's EPU Project Management organization will be an essential element to project success. Though still being staffed, the organization appears to be appropriately structured and managed at this time.
- ◆ A framework for adequate oversight of project management by senior management exists. Plans for communications within the project management organization appear to be appropriate at this time.

### **Cost and Schedule Monitoring Controls**

- ◆ Cost and schedule monitoring controls are still in the process of development. Limited results are available for assessing the adequacy of these controls at this time.

### **Contractor Selection and Contractor Management**

- ◆ FPL appears to have followed its contractor selection procedures. Given the unique challenges and circumstances of the nuclear industry, FPL's use of sole source selections for the uprate project to date is in keeping with reasonable business practices.
- FPL's approach to contractor oversight and evaluation appears to be appropriate to date. Proactive project management by FPL should require frequent communication and updates, demand contractor accountability, and challenge information provided by contractors.
- ◆ FPL has made efforts to ensure effective contractor performance by means of contract provisions and structure. This approach appears to appropriately seek control of contract costs through the use of contracts structured to encourage contractor performance.

### **Auditing and Quality Assurance**

- ◆ FPL's internal audit effort for the uprates is in the early stages, but the structure and plans for the audit function appear adequate. As the project progresses, frequent internal audits and quality assurance audits will be necessary to ensure successful completion of the uprates.

## **1.4.2 Turkey Point Units 6 & 7 Construction Project Observations**

Audit staff made the following observations for the key areas of activity it examined for the Turkey Point 6 & 7 construction project. The conclusions in each instance are subject to the limitations inherent in the information that was available to staff during March through June 2008.

### **Project Planning**

- ◆ FPL's site selection process appears to have been reasonable and in keeping with good business practices.
- ◆ FPL's plant design selection process was reasonable and effective in positioning the company to meet the anticipated need for capacity in 2018.
- ◆ FPL's development of the option to consider separate contracts for project construction and for engineering and procurement may reduce total construction costs. FPL should continue to evaluate the impact of the timing of contractor selection on the overall project schedule.
- ◆ FPL has appropriately proceeded with the required regulatory approvals, scheduling, and preparation of applications in a manner that will accommodate the planned project completion dates.
- ◆ FPL has taken a reasonable approach to developing project schedules at this early stage.
- ◆ FPL has to date taken reasonable steps to identify, evaluate, and mitigate project risks associated with successful completion of the Turkey Point Units 6 & 7 project. Successful project completion will require continued vigilance in risk management and re-assessment of project viability at key decision points.

### **Project Management and Organization**

- ◆ Effective oversight by the Turkey Point 6 & 7 Project Management organization will be an essential element to success. Though still being staffed, the organization appears to be appropriately structured and managed.
- ◆ Reporting tools for the new organization are still being completed, but thus far appear to provide adequate project oversight.



### **Cost and Schedule Monitoring Controls**

- ◆ Cost and schedule monitoring controls specific to Turkey Point Units 6 & 7 are still in the process of development. Limited results are available for assessing the adequacy of these controls at this time.

### **Contractor Selection and Contractor Management**

- ◆ FPL appears to have followed its contractor selection procedures. Given the unique challenges and circumstances of the nuclear industry, FPL's use of sole source selections for the new Turkey Point Units 6 & 7 project to date is in keeping with reasonable business practices.
- ◆ FPL's approach to contractor oversight and evaluation appears to be appropriate to date. Proactive project management by FPL should require frequent communication and updates, demand contractor accountability, and challenge information provided by contractors.
- ◆ FPL has made efforts to ensure effective contractor performance by means of contract provisions and structure. This approach appears to appropriately seek control of contract costs through the use of contracts structured to encourage contractor performance.

### **Auditing and Quality Assurance**

- ◆ FPL's audit effort for Turkey Point Units 6 & 7 is in the very early stages, but the structure and plans for the audit function appear adequate. As the project progresses, more frequent internal audits and quality assurance audits will be necessary to ensure successful completion of Turkey Point Units 6 & 7.

## 2.0 St. Lucie and Turkey Point Uprate Projects

### 2.1 Project Planning

#### How did FPL identify the scope of work for the uprate projects?

In the second quarter of 2007, FPL began internal feasibility studies to determine the potential for a nuclear power uprate of St. Lucie Units 1 & 2 and Turkey Point Units 3 & 4. The studies examined the capability of the existing systems, the feasibility of the extended power uprate, economic break points, possible plant modifications needed, and estimated costs for completing the four unit uprate. Based on the results of these initial studies, a list of detailed modifications was developed for the plant's steam system, balance of plant, and turbine generator components.

FPL evaluated both the design and operating conditions of plant components to determine whether these components could be used under the uprated operating environment. Several components were identified as requiring repairs or modifications. Other "high risk" contingency modifications were also identified for further consideration and detailed study before making a final decision on those components. The FPL internal studies included estimates of uprate project base costs with contingency and escalation factors.

In September 2007, Shaw Stone & Webster (SS&W) was engaged by FPL to perform an independent "expert" review of the proposed Turkey Point and St. Lucie EPU. The scope of the review included an assessment of FPL's internal EPU Feasibility Study estimates for appropriate methodology, completeness of detail, definition of assumptions and clarifications, and the determination of risks. The primary goal of the review was to independently evaluate FPL project planning and estimating status, determine the progress of the overall effort, identify any fatal flaws regarding scoping requirements or estimating methodology, and make any critical recommendations for consideration in the business case planned to be presented to FPL executive management. The review was completed by the SS&W team in two and a half days. The team conducted key interviews with project Managers and Directors, and reviewed the project work books containing detailed and preliminary information defining the project scope.

The SS&W review team noted that in their view the project plans and estimates were more thoroughly developed than a rough order of magnitude status, and it approached the detail of a conceptual stage of readiness package. The SS&W study results indicated that the overall scope of the projects had been well researched and benchmarked against the available industry experience, incorporated within the base estimates. The SS&W team also provided several key issues for management focus and application of risk mitigation strategies in the areas of:

- ◆ Safety
- ◆ Regulatory and environmental
- ◆ Staffing
- ◆ Scope control
- ◆ Scheduling
- ◆ Estimating

As part of its initial considerations for the uprate projects, FPL evaluated long lead-time equipment, materials, commodities, labor, operational licensing amendments, environmental impacts of the uprates, and the possible need for additional transmission facilities. FPL completed an initial feasibility study to determine the potential costs for completing necessary transmission grid studies related to the completion of the St. Lucie and Turkey Point uprates. Estimates of the costs of these studies were included into FPL's cost estimate, but the studies are not all yet completed. According to FPL, the transmission grid studies are a complex series of analyses expected to be completed in 2009. These studies will determine the impact on the switchyard connected grid and will define the modifications necessary to accommodate the increased power capacity resulting from the uprate.

Additionally, FPL performed several iterations of a Nuclear Uprate Economic Analysis to consider differing fuel and emissions scenarios and their impacts on uprate costs. From these inputs, the company reached its initial estimates of costs and completion timeframe for completing the St. Lucie and Turkey Point uprates.

**The FPL scope evaluation process appropriately provided technical and managerial evaluation of the risks, costs, benefits, and overall feasibility of the St. Lucie and Turkey Point uprate projects.**

### **What regulatory approvals are required for completion of the uprate projects?**

The Nuclear Regulatory Commission (NRC) regulates the maximum power level and other technical specifications under which nuclear power plants operate. The licensee can only change these documents after the NRC approves a License Amendment Request (LAR). FPL states that separate LARs will be issued for St. Lucie Units 1 & 2, due to the differences in nuclear fuel for the two units. Since Turkey Point Units 3 & 4 use the same fuel type and configuration the two units will be covered under a single LAR.

FPL states that the NRC approval process is the critical path item for the uprates, and that FPL licensing preparation alone, is approximately 18 months. The NRC acceptability reviews are expected to take approximately two months for each application. However, FPL states that, due to the magnitude of the uprates, the NRC review will take an additional 12 months before the final approval of the License Amendment Request is received. Included in that review period are responses to requests for additional information and an independent assessment by the Advisory Committee on Reactor Safeguards. FPL estimates that the License Amendment Requests for St. Lucie Units 1 & 2 and Turkey Point Units 3 & 4 will be submitted to the NRC in September 2009.

At the state level, Section 403.519, Florida Statutes, requires FPL to petition the Florida Public Service Commission and show the need to modify generation facilities to increase

capacity. FPL filed its petition with the Florida Public Service Commission on September 17, 2007, and received approval of the uprate request on January 7, 2008.<sup>1</sup>

Florida Department of Environmental Protection approval of a Site Certification Application is required for plant uprates of 75 MW or more. As directed by Sections 403.501-401.518 of the Florida Statutes, the Department coordinates with other state and local agencies to assess public health and environmental aspects of the planned uprates.

Ultimately, site certification is decided by the Siting Board (Governor and Cabinet) or in a non-contested case by the Secretary of the Department of Environmental Protection on behalf of the Board. FPL submitted its site certification application for St. Lucie Units 1 & 2 in December 2007, with approval expected by the end of 2008. The site certification application for Turkey Point Units 3 & 4 was submitted in January 2008, with expected approval by February 2009.

FPL has considered the required permit, certification, and licensing amendments to assure county, state and federal regulatory approvals are received and the uprates are completed on schedule. FPL has also considered that the uncertainty of timely regulatory approvals could delay the uprate projects completion.

**FPL has appropriately proceeded with the required regulatory approvals, scheduling, and preparation of applications in a manner that will accommodate the planned project completion dates.**

**Has FPL developed a project plan to meet the desired project completion date?**

FPL has scheduled the St. Lucie and Turkey Point uprates to be completed during scheduled fuel outages in 2011 and 2012. The uprate schedule for each of the four units is the following:

- ◆ St. Lucie Unit 1 - Fall of 2011
- ◆ Turkey Point Unit 3 and St. Lucie Unit 2 - Spring of 2012
- ◆ Turkey Point Unit 4 - Fall of 2012

Uprate project scheduling is being completed through the use of Primavera scheduling software. The Controls Group, within the EPU Project Management organization, tracks the automated project schedule daily and updates the schedule weekly. Primavera allows FPL EPU Project Management and Plant Site Management to daily monitor and report the schedule status. Weekly project schedule updates include necessary adjustments to critical path activities and are reflected in executive management reports and update meetings.

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<sup>1</sup> Order No. PSC-08-0021-FOF-EI.

Long-lead equipment purchases for the uprates have been reserved, and critical dates are entered into the uprate schedule. By entering into negotiations with long-lead vendors at an early point in the project, FPL secured a place in the suppliers' queues for delivery of turbine-generator equipment and services. FPL believes this early project activity secured advantageous turbine-generator pricing and a manufacturing slot that will support uprate project completion timeframes. Remaining long-lead equipment specifications are being completed for procurement based on the timing of their use in the project.

The Integrated Supply Chain (ISC) organization also works with EPU Project Management, nuclear engineering, and other subject matter experts to ensure procurement contracts are completed, and equipment is ordered in time to meet the project work schedule. FPL's schedule identifies the procurement, receipt, and installation timing for each major piece of equipment in the project schedule. The schedule tracks each component through its receipt and installation on site.

FPL states that its final engineering modifications are expected to be on-site at the plants approximately 18 months prior to the beginning of 2011 uprate work, and equipment is expected to be on-site three months prior to the planned outage. The completion of these critical engineering modifications are also entered into the project schedule and tracked through their completion.

Although FPL's project budget and schedule are in their early stages, FPL expects to have a completed first level project budget and schedule by the third quarter of 2008. According to FPL, subsequent iterations of the schedule will include additional detail of work to be completed and will add to the number of activities tracked in the automated project schedule.

**FPL's approach to planning the uprate projects to date has been appropriate. Developing phase two and phase three project schedules will be critical to project planning.**

### **Was FPL's risk evaluation for the uprate projects reasonable?**

The FPL risk assessment process is vital to identifying and controlling potential risks associated with the Turkey Point Units 3 & 4 and St. Lucie Units 1 & 2 uprates. Unidentified risks may seriously delay the project schedule or considerably increase project completion costs. FPL risk assessment is performed from the initial project evaluation through the project implementation.

FPL's Risk Committee assists senior management in considering risk mitigation and financial decisions. This committee represents members from all aspects of the company's nuclear and generation operations. The Risk committee reviews and evaluates initial cost projections and any significant variances from the schedule and cost projections. This committee provides a forum of senior managers to critically assess and discuss the risks faced by the uprate projects from different departmental perspectives. The Risk Committee ensures that project risks and mitigants are identified, ownership is assigned, and actions are taken to manage or eliminate the assigned risk.

FPL has considered many different key potential risks to the uprate projects, including:

- ◆ Uprate management experience
- ◆ Lessons learned from previous industry uprates
- ◆ Experienced uprate vendors
- ◆ Regulatory permitting and licensing delays
- ◆ Global resource constraints

FPL believes that its corporate experience in uprate activity will benefit it in managing and controlling the risks associated with the St. Lucie and Turkey Point uprates. FPL states that, in 2006, FPL Energy completed successful uprates of its Seabrook and Duane Arnold plants. FPL has hired former FPL Energy employees to assist with managing the St. Lucie and Turkey Point uprates. FPL notes these key managers completed the Seabrook uprate on time and within budget.

FPL uprate management has developed risk mitigation strategies to reduce the possibility of different potential project conditions that could become problematic to the uprates. Based on its experience with other system uprates, FPL uprate management has reviewed “lessons learned” from other uprates completed in the United States nuclear industry to help mitigate risks associated with the complexity of the St. Lucie and Turkey Point uprate projects.

The company believes it has reduced its risk of contractor non-performance by contracting with experienced uprate contractors. For instance, FPL contracted with Shaw Stone & Webster as the engineering consultant to prepare the License Amendment Requests, balance of plant engineering evaluations, balance of plant licensing report, develop major equipment specifications, and prepare conceptual designs for plant modifications for the Turkey Point and St. Lucie uprates. FPL management states that SS&W is the most experienced uprate engineering firm in the US nuclear industry. FPL says that SS&W has completed power uprates for 46 operating nuclear units, including the Combustion Engineering Pressurized Water Reactor design in use at St. Lucie 1 & 2. SS&W was also contracted to do work at the Seabrook uprate project where they were part of the successful uprate contractors group.

FPL must continue to ensure compliance with FDEP rules and requirements during and after the uprate. At both the St. Lucie and Turkey Point plants, FPL has conducted a cooling water analysis of the power uprates’ impacts on cooling systems and cooling discharge canals. Study results indicate the impacts of the increased heat exchange can be mitigated sufficiently to meet FDEP requirements at both plant uprate locations. FPL has completed scoping and feasibility studies to reduce the risks associated with regulatory permitting and licensing delays.

FPL recognizes that the increased volume of NRC licensing requests, both for uprates and new nuclear units being constructed, poses a risk of regulatory delays. FPL management observes that NRC resource constraints could slow approval of applications. FPL has included the risk of potential licensing delay in its schedule preparation and plans to monitor the approval process closely.

Similar schedule risks are posed by possible global resource constraints within the nuclear industry. Early in 2007, FPL prioritized equipment with long-lead manufacturing timeframes, and paid for manufacturing slots to assure key equipment is manufactured and delivered in time to meet the uprate schedule. FPL deals with Westinghouse on a daily basis for its existing nuclear plants, as well as on key projects such as the uprates. FPL management is satisfied that the selected vendors will have the capability to satisfy both current commitments and those required by the FPL uprates.

FPL's uprate Project Management organization uses the EPU Project Risk Management report to monitor project risks. This report is presented to executive management in weekly and monthly meetings for information and discussion. The EPU Project Risk Management report identifies potential project risks by, plant site, unit, priority (high, medium or low), probability (percent range), impact, economic cost, and risk owner. Additional information regarding the risk event includes: the root cause, the process or controls in place, mitigation actions, status, risk mitigation manager, expected completion date for actions, and mitigation costs. As risk items are mitigated they are closed, but remain on the report. FPL uses this report to identify risks, assign authority for mitigation actions, and track risks associated with the uprate project.

**FPL has to date taken reasonable steps to identify, evaluate, and mitigate project risks. Successful project completion will require continued vigilance in risk management and re-assessment of project viability at key decision points.**

## 2.2 Project Management and Organization

**Is an appropriate project management organization in place for the uprate projects?**

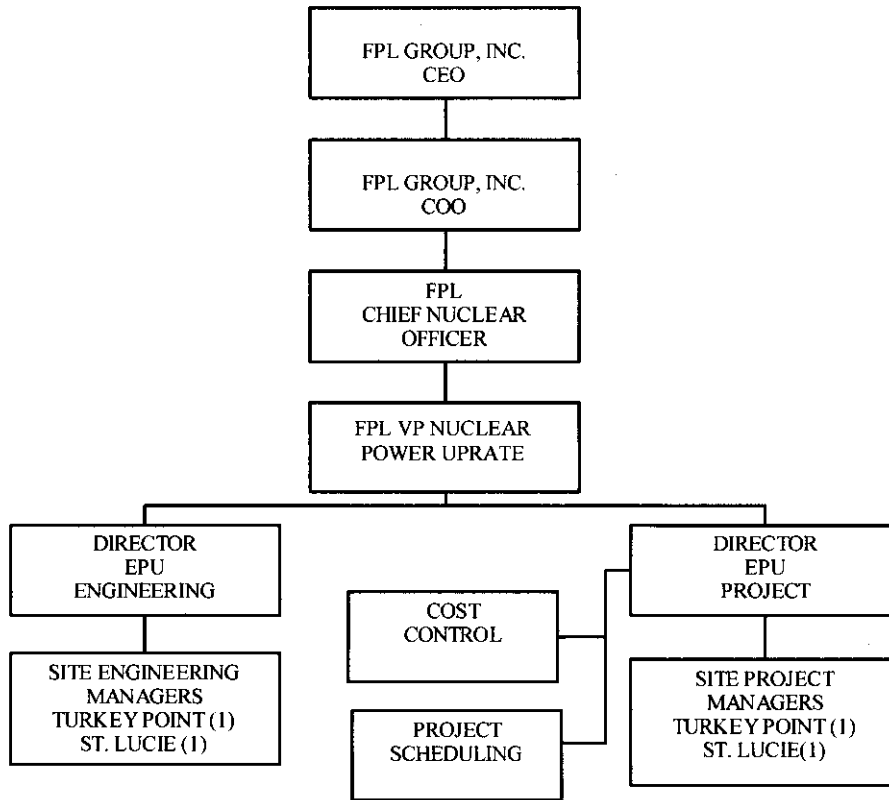
FPL has established a separate Uprate Organization within the Nuclear Division responsible for monitoring and managing uprate scheduling and costs. As shown in **Exhibit 1**, the nuclear uprate Project Management organization is headed by the Vice President Technical Services, who reports to the Chief Nuclear Officer. The Chief Nuclear Officer (CNO) reports to FPL's President.

The EPU Project Director and EPU Engineering Director share oversight responsibility for the St. Lucie and Turkey Point uprate projects. Both EPU Directors report directly to the VP Nuclear Power Uprate, and inform him daily on the uprate project status. The EPU Project Director is responsible for the overall implementation of the project, including implementation of all modifications, and managing the project schedule and budget. The EPU Project Director is also responsible for developing the processes and administrative controls necessary to complete the uprate projects. The Engineering Director directs all engineering, including system modifications essential to completing the uprates. The EPU Engineering Director is also responsible for all licensing and design activities related to the uprates.

Separate St. Lucie and Turkey Point EPU Project Managers direct uprate work at each plant site and report to the EPU Project Director. Similarly, separate St. Lucie and Turkey Point

EPU Project Engineers report engineering project status to the EPU Engineering Director. The EPU Project Managers each have on-site Uprate Team staff to assist in project management and engineering design activities necessary to support the uprate project at the plant.

### FPL NUCLEAR UPDATE ORGANIZATION



- SYSTEM & COMPONENT EVALUATIONS
- MODIFICATIONS
- DOCUMENTATION UPDATES
- IMPLEMENTATION SUPPORT
- TESTING

- COST CONTROL
- INTEGRATED SCHEDULE
- MODIFICATION PLANNING
- TEMPORARY FACILITIES
- IMPLEMENTATION

**EXHIBIT 1**

*Source: DR-5.8, DR-1.4a*



Each on-site Uprate Team coordinates site activities with vendors to ensure the contracted work activities are completed on schedule and on budget. The teams will oversee contractor work activities and help resolve roadblocks that arise at the plant site during the uprates. On-site engineering design activities are related to specific system modifications and replacements performed at the plant during the uprate. If scope changes and design modifications require additional engineering, the on-site engineers identify corrections and make recommendations to the EPU Project Managers. Project delays or increases in costs are reported by the EPU Project Managers to the EPU Project Director and EPU Engineering Director, for review and reporting to executive management. The uprate organization currently numbers about 72 FPL employees and contract staff.

Other organizations also provide support activities to the on site Uprate Team as needed. For instance, the Integrated Supply Chain supports on site efforts through necessary procurement of components and services required for the uprate projects.

**Oversight of the uprate project by FPL's EPU Project Management organization will be an essential element to project success. Though still being staffed, the organization appears to be appropriately structured and managed at this time.**

### **Are appropriate oversight and accountability controls over project management in place?**

EPU project oversight and accountability is the primary responsibility of the EPU Project Management organization. Oversight activities include the following:

- ◆ Informing senior and executive management of project status
- ◆ Procuring and delivering components and services to successfully implement the uprates
- ◆ Coordinating contractor activities within the plants
- ◆ Monitoring and updating the project schedule overseeing project budgets
- ◆ Identifying project risks and mitigation strategies
- ◆ Resolving challenges to timely and cost-effective completion of the project

These tasks are completed through the coordinated efforts of the EPU Project Management team, interdepartmental support, intercompany cooperation, and company oversight and steering committees.

Other major accountability and oversight activities include:

- ◆ Project reports and updates from Project Management
- ◆ Project reports to senior management
- ◆ Decision making reviews concluded by internal committees
- ◆ Project strategies for problem resolution
- ◆ Technical risks and issues

The EPU Project Management Directors report to the VP Nuclear Power Uprate, and provide: frequent updates on project milestones, budget summaries, material spending, vendor strategy, engineering strategy and evaluation, company and contractor staffing levels, weekly activity status by unit, weekly planned activities, scheduling of key events, monthly cash flow analysis, cost performance updates, contract log and cost analysis data, and risk management.

These informational reports are used by the VP Nuclear Power Uprate to manage the project on an ongoing basis and to inform executive management, steering committees, and senior management of the uprate project status. Project Management reports ensure that management at all levels are kept informed and have adequate information to make informed management decisions regarding the uprate project.

Several internal boards and committees provide input and expertise from different perspectives for decision-making and management of the project. FPL's Executive Steering Committee is responsible for approving large capital projects such as the uprate project. This committee consists of senior management officers including the Chief Operations Officer, Chief Financial Officer, Chief Nuclear Officer, Nuclear Chief Operations Officer and the Presidents of FPL and FPL Energy. This committee may also call upon the Risk Committee, as needed, to provide independent oversight and input regarding specific aspects of the project.

At a technical executive management level, FPL's Extended Power Uprate (EPU) Project Steering Committee manages the interface between organizations involved in the uprate. The EPU Project Steering Committee allows executive management to meet with FPL project management and contractors in a single meeting to discuss challenges to the project. It is chaired by the VP Nuclear Power Uprate, with the Nuclear Chief Operations Officer as the Vice Chairman. Other members of the Committee include the Vice President-Integrated Supply Chain, Nuclear Division Regional Operational Vice Presidents, Westinghouse Electric Company, Siemens, Shaw Stone and Webster, and other major vendors as needed.

This committee approves the final set of uprate plant parameters and thermal performance data for the uprates. It reviews project schedules, budgets, key assumptions, and significant deviations. The Committee reviews project risks for each site, reviews major milestones and modifications to the uprate projects, and provides an avenue for team members to identify challenges and issues where senior management assistance is needed. The EPU Project Steering Committee meets periodically, but generally every six weeks.

The FPL uprate organizational structure also includes the Nuclear Division Technical Challenge Board, which provides an independent technical oversight. The Board ensures proper

processes are followed, critical issues and major risks are reviewed by senior level management, and that industry experience is considered in the design and modification process. The Board is made up of senior members of the Nuclear Division providing expertise in plant safety and operations, engineering, licensing, and equipment modification.

**A framework for adequate oversight of project management by senior management exists. Plans for communications within the project management organization appear to be appropriate at this time.**

### **2.3 Cost and Schedule Monitoring Controls**

**Has FPL developed an adequate control system for monitoring project schedules and costs?**

A key component of the Project Director's organization is the Project Controls Group. This group monitors both the project schedule and budget. The Project Controls Manager records schedule changes, project delays, project costs, and provides informational support to project management and contract administration. Project Management staff receives weekly updates of the project's schedule and costs from the Project Controls Group, and it informs executive management of the project status through weekly update meetings.

The FPL uprate budget is preliminary and considered to be a Level I budget. FPL states that the Level I budget is expected to be complete by the third quarter 2008. The Level I budget is based on FPL's initial project views, and it provides the basis for more refined versions of the expected costs as the project continues. Upon completing the Level I budget, FPL will begin further definition of all items within the budget and begin developing more granular line item estimates for a new Level II budget in 2009.

The Uprate Cost Engineer monitors and reports project costs associated with the uprate projects. The Cost Engineer receives contractor invoices and forwards them to the technical representative for the specific area to ensure the scope of work has been completed, and the deliverables have been accepted. The Cost Engineer checks the PASSPORT system to verify that adequate funding is available to make payment of the invoice. On fixed-price contracts, the Cost Engineer matches up the invoice amount and the deliverable work received from the subject matter expert. The completed package is then passed to the appropriate level for approval and payment.

Primavera software allows the Project Controls Group to make changes to the schedule and scope of project work as it is approved by management, and serves as a control for monitoring project scheduling updates. Approximately 25,000-35,000 project task items will ultimately be included in the uprate project schedule, which must be monitored daily and updated for weekly management review and consideration. Primavera also allows the Project Controls Group to develop additional reports specific to the requests of executive management. The flexibility of the scheduling system allows FPL management to examine the project status at any time and request specialized reports upon request.

Revisions for value-added scope changes are updated with the scope change information, and they are sent to the appropriate level for signature. Each line entry on the purchase order separates the change for the appropriate unit, thus specifying the change and approved dollar amount for the particular unit. Time and material contracts are verified by the Cost Engineer through time reporting and material requisition systems against contractor time reports and charges on the invoice. Once verified the invoice package is forwarded for appropriate executive approval and payment.

**Cost and schedule monitoring controls are still in the process of development. Limited results are available for assessing the adequacy of these controls at this time.**

## 2.4 Contractor Selection and Management

**Has FPL's selection of the current set of contractors and vendors been reasonable?**

Due to the highly technical and specialized nature of electric generation and the nuclear industry in general, many services and products are provided by a small number of major vendors worldwide. This configuration creates some concerns, since the possibility of price-fixing increases in markets where there are few suppliers.<sup>2</sup> Industry mergers, partnerships, and corporate consolidations also present challenges that will require vigilance by FPL management to ensure the company receives fair pricing.

FPL's current vendors and contractors for the uprate projects were selected both through the competitive bid process and through the use of sole sourcing. In maintaining or enhancing an existing plant, the utility often must consult with and/or employ the original designer or original equipment manufacturer. Usually, these vendors continue to play major roles in the plant over its useful life.

FPL's Integrated Supply Chain organization maintains established vendor lists to use for competitive bidding situations. FPL's Nuclear Policy 1100, states that competitive bidding is FPL's standard approach for the procurement of materials and services with an estimated total value greater than \$25,000.<sup>3</sup> FPL nuclear procedures also state that bids should be requested from as many bidders as considered reasonable and practicable, but not more than ten. The procedure further states that in all bid situations, bids should be solicited from at least three bidders.<sup>4</sup>

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<sup>2</sup> In 2007, the European Union fined a group of major electric industry plant engineering firms and component suppliers for price-fixing. The fines totaled nearly one billion dollars. Several of the companies fined are either contractors for the new PEF and FP&L nuclear units, or have bid on components for these projects. "Siemens Hit with £400 Million Fine," *Der Spiegel* Jan 25, 2007 <<http://www.spiegel.de/international/0,1518,druck-462199,00.html>>, "EU Fines Siemens, AREVA, Alstom for Price Fixing," *The Economic Times* Jan 25 2007 <<http://economictimes.indiatimes.com/articleshow/msid-1438615.prtpage-1.cms>.

<sup>3</sup> FPL Procedure NP-1100, section 1.2

<sup>4</sup> *Ibid.*, sections 2.1 and 3.5

However, FPL's nuclear policy does not exclude the approved use of sole source, single source, and Original Equipment Manufacturer providers in certain situations. Sole or single source procurements should be used on a limited exception basis, only when they can be justified.<sup>5</sup> FPL procedures state that if FPL Integrated Supply Chain is unable to identify more than one bidder, or the bid process only results in one bidder, it is not considered single or sole source, and the requirements for documenting sole or single source justification are not required.<sup>6</sup>

FPL nuclear policies note that in cases where a nuclear department believes valid business reasons support making a sole or single source purchase, a sole or single source justification will be provided by the requestor, and it will be incorporated within the purchase requisition.<sup>7</sup> The justification may also be by separate memo and be included in the purchase file.

Original Equipment Manufacturer procurements for materials and equipment where no other provider exists need not be reported as sole source. Nuclear policies specify that when Original Equipment Manufacturer equipment is specified, it must be documented in the purchase requisition or the purchase order file by the Purchasing/Contracts agent.<sup>8</sup> Original Equipment Manufacturer documentation may also be made by separate memo, included within the purchase file.

FPL has included four uprate contracts in excess of one million dollars in its current nuclear cost recovery filings. As shown in **Exhibit 2**, the largest contracted dollar amount is with Westinghouse Electric Company, for engineering support of the nuclear fuel parameters, fuel burn uprates, primary system pressure and temperature operating parameters. The second largest contract is with Shaw Stone & Webster, for engineering support associated with steam and feed water systems and the turbine generator electrical capacity. FPL has two contracts with Siemens Corporation. One contract reserves manufacturing forging slots for the St. Lucie Units 1 and 2 Low Pressure Turbine rotors, and the other contract is for the Turkey Point Unit 3 Generator rotor.

Westinghouse was selected for a sole source fixed-price contract to provide the initial Nuclear Steam Supply System critical path activities in support of the EPU, to evaluate and analyze performance of design basis accident analysis, and to design upgrades for the Nuclear Steam Supply System components and fuel design for the uprates at both units. FPL notes that as the original manufacturer, and owner of the units' design and detailed safety analysis, Westinghouse is the only choice for this work on Turkey Point Units 3 & 4 and St. Lucie 2. AREVA owns the Babcock & Wilcox safety analysis for St. Lucie Unit 1 and was selected as the sole source supplier for fuel related engineering, licensing, design, and analyses for that unit.

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<sup>5</sup> Ibid., section 1.2

<sup>6</sup> Ibid., section 2.1

<sup>7</sup> Ibid, section 2.2

<sup>8</sup> Ibid, section 2.3

**St. Lucie and Turkey Point Uprate Project  
 Contracts Greater Than \$1 Million 2007-2008**

<b>Westinghouse Electric Company</b>	NSSS Engineering Support for all four units	8/1/07	Sole Source	Fixed Price	\$1,100,000	\$5,600,000
<b>Shaw Stone &amp; Webster</b>	BOP Engineering Support for all four units	10/2/07	Sole Source	Time and materials	\$1,853,591	\$3,291,200
<b>Siemens</b>	SL 1&2 Low Pressure Turbine Rotor Forging Reservation	11/15/07	Sole Source	Fixed Price	\$1,100,000	\$1,100,000
<b>Siemens</b>	TP 3 Generator Rotor Forging Reservation	1/30/08	Sole Source	Fixed Price	\$3,675,000	\$3,675,000
<b>Total</b>					\$7,728,591	\$13,666,200

**EXHIBIT 2**

*Source: Schedule AE-8*

Shaw Stone & Webster is another single source supplier, selected to complete the initial Balance of Plant scoping support for the EPU of St. Lucie and Turkey Point units, Balance of Plant engineering report, and licensing report for St. Lucie and Turkey Point uprates. An additional EPU Phase 2 Scoping Study was added to the initial contract to develop information on scope modifications and costs to achieve target EPU power levels for Turkey Point and St. Lucie uprates. FPL states that SS&W has participated in between 40 and 50 uprates of the approximately 100 completed in the U.S. nuclear industry. SS&W was also the low bidder on the previous Turkey Point uprate, and was the low bidder at Seabrook's uprate. Therefore, FPL has confidence that SS&W can perform well in its project roles and FPL reduces project risks by using a proven performer in uprates

In the Fall of 2007, FPL met separately with suppliers of turbine-generators who had responded to its Request For Proposals. Five qualified vendors made presentations to FPL and offered to meet the uprate projects' turbine-generator needs. Presentations from prospective vendors were reviewed by appropriate Integrated Supply Chain and Nuclear Management personnel. In some instances, vendors' proposals would have required FPL to modify additional portions of its systems to make the uprate components compatible with FPL's existing plant. According to FPL, these additional modifications would cause significant additional costs.

Through its evaluation of the presentations, FPL identified only one prospective vendor that could provide the turbine generator equipment and experience it requested to meet the uprate schedule. Based on the review of prospective vendor presentations by Toshiba, Mitsubishi and

Alstom, FPL management selected Siemens as the turbine-generator vendor for the uprates. FPL has since provided a binder payment to secure a long-lead manufacturing slot with Siemens, and was negotiating a final contract as of May 2008.

Siemens was the sole-source vendor for the initial engineering study of the turbine generator replacement evaluation, development of preliminary heat balances, and analysis of the turbine generator components and upgrades for the St. Lucie and Turkey Point units. Siemens received two lump sum contracts reserving the manufacturing slots for one generator rotor forging for the Turkey Point Unit 3 main generator rotor and for four low pressure rotors for the St. Lucie uprate. FPL states that Siemens was not truly a sole sourced vendor because it was selected as turbine generator supplier after FPL reviewed other potential Request For Proposals.

**FPL appears to have followed its contractor selection procedures. Given the unique challenges and circumstances of the nuclear industry, FPL's use of sole source selections for the uprate project to date is in keeping with reasonable business practices.**


**Is an appropriate set of internal controls for contractor management and evaluation in place for the uprate project?**

FPL procedures provide for basic contractor oversight by the EPU Site Project Manager, the site Technical Representative, and Contract Coordinators who administer site services. These functions coordinate contractor reviews of performance while contractors are on the site working. Upon completion of the authorized work, the Site Technical Representative verifies the contractor has met all obligations and determines whether any outstanding contract deliverable issues exist. Technical Representatives also determines whether billed work was completed and what level of approval is needed for payment.

The EPU Site Project Manager will provide oversight of the contractor progress and project work performance while the contractor is on site. If schedule delays are anticipated due to contractor challenges, the EPU Site Project Manager attempts to resolve the contractor challenge on site. If necessary, the Site Project Manager will bring in the EPU Project Director to help resolve issues and involve executive management.

In addition to providing assistance with developing and administering contracts, FPL's Nuclear Sourcing and Integrated Supply Chain completes weekly updates to the Project Contract Log and reports updated contract status to FPL executives and Project Management. Nuclear Sourcing also completes annual vendor scorecards for a selected group of FPL's largest vendors. These scorecards provide an overall rating for system-wide vendor performance for the year across all areas of FPL operations. Performance is indicated using a color rating system of: green for good performance, yellow for questionable performance, and red for poor performance. The process is intended for FPL to identify vendor performance strengths and weaknesses and to use in discussions with vendor management when improvement is needed.





EPU Project Management indicated to audit staff that it would take aggressive steps to mitigate similar performance issues. Siemens is one of the few suppliers capable of providing the turbine equipment and services needed, and the only one evaluated by FPL that was able to meet the outage schedule for the uprate projects. FPL EPU Project Management also noted that this knowledge is helpful to management as they negotiate vendor contracts to include protection provisions. FPL noted that the need for close supervision of vendor performance, and early detection of schedule and cost related issues is understood by the EPU Project Management team.

**FPL's approach to contractor oversight and evaluation appears to be appropriate to date. Proactive project management by FPL should require frequent communication and updates, demand contractor accountability, and challenge information provided by contractors.**

**Has FPL implemented appropriate protections from contractor cost overruns or poor performance on the uprate projects?**

To protect itself from substandard and contractor work, FPL maintains a qualified vendor list and evaluates contractor work after major projects. Documentation of contractor performance allows FPL to identify poor performance trends with contractors and provides a tool to use in correcting contractor performance or denying the contractor future work. The Quality Assurance function also reviews contractor performance for safety-related contracts, while the contractor is on site as discussed further in Section 2.5.

In addition to the contractor management and evaluation process previously discussed, FPL has structured its contracts and purchase orders to identify specific scope, deliverables, completion dates, terms of payment, operational terms and conditions, reports from the contractor, and work quality specifications. Standard contract terms include suspension/termination for cause or suspension/termination for convenience address the conditions under which a contractor's services may be suspended or terminated. Limit of Liability clauses specify the liability of the company and the contractor under specific conditions and situations. Contract clauses addressing changes to scope of work and schedule changes state the conditions under which changes to work scope will be accomplished. These and other FPL contract provisions help protect the company against contractor overruns and ensure that contractors perform work on time as specified.



In some cases, FPL contracts include performance incentives for completing quality work ahead of schedule or penalties for late work. FPL contracts generally include specified provisions for liquidated damages to provide protection against contractors causing damage to company property or facilities, and for non-performance impacting company generation capabilities.

The EPU Site Project Manager will coordinate all contractor work completed on the project and reports potential project work stoppage or delays upward to the EPU Project Directors. If project scheduling or budgeting are seriously jeopardized by contractor non-performance, the EPU Project Directors may remove non-performing contractors and secure other contractors to perform the scope of work. Based on the scope of work and seriousness of contractor non-performance, FPL senior management may be involved to work with senior management of the contractor's company, as well.

To help protect against major cost overruns, FPL has structured its major uprate project contracts to include fixed price and lump sum contracts where possible. These contracts specify a fixed price for completing a specific scope of work, thus assuring that the cost for that scope of work is known. The contractor is paid a fixed sum for completing the work and is locked into that price.

In other cases, FPL has used target price contracts as a basis for controlling costs. The target price is given as a contract amount for completing a scope of work that is known, but it may be expanded by the company. The contracted work will be completed for a target price, but it may be negotiated further, due to work scope change, additional scope, or modifications to the work scope. The contract price is agreed to be the target for the specified scope to limit the cost of that specific work. FPL also uses time and materials contracts when the requesting business unit recommends its use and when the firmness of scope is less certain.

Examples of FPL's uprate contracts greater than \$1 million include, a fixed-priced contract with Westinghouse, two fixed-price contracts with Siemens Corporation, and a time and materials contract with Shaw Stone & Webster. Each of these contracts perform different scopes of work, therefore, different types of contracts are used by FPL to control costs.

**FPL has made efforts to ensure effective contractor performance by means of contract provisions and structure. This approach appears to appropriately seek control of contract costs through the use of contracts structured to encourage contractor performance.**

## 2.5 Auditing and Quality Assurance

### **Does FPL have appropriate auditing and quality assurance functions in place for the uprates?**

FPL's Internal Audit Group completes scheduled and management requested audits of all company operations. The Annual Audit Plan is based on operational and financial risks associated with the annual corporate business plan. Internal Audit discusses the potential list of annual audits, rated as low, medium, and high risk, and discusses those with the Vice President of each Business Unit.

To date, FPL has completed one internal audit of the St. Lucie and Turkey Point uprates. In July 2008, FPL Internal Audit completed an audit of expenses for St. Lucie and Turkey Point uprates, to ensure costs associated with the uprate were correctly charged to each project. The audit scope also included an examination of support documentation for expenditures, and whether unauthorized regular maintenance costs were charged to the uprate. The audit examined project charges made during May 2007 through March 2008.

During this review, audit staff reviewed purchasing audits related to nuclear operations during the period 2005 through 2007, to determine the number and areas of purchasing audits conducted. During the three-year period, eight nuclear purchasing audits were completed. Of the eight audits performed, the level of findings were not significant, and FPL management appears to have responded adequately to the audit findings issued by implementing all audit recommendations.

In addition to FPL's internal auditing effort, FPL's Quality Assurance (QA) function performs safety-related vendor audits and QA contractor performance evaluation reports. FPL procedures<sup>9</sup> require that once the contractor is on site, the QA Manager should review the contractor's QA program procedures and personnel qualifications. The QA Manager is to review contractor on-site procedures for compliance with FPL's QA Program commitments and special certifications for compliance with FPL committed codes. The QA Manager also coordinates the resolution of any contractor conflicts with the Quality Program. FPL's QA organization is responsible for performing audits or surveillances on safety-related and quality-related services, where they are performed under the contractor's QA Program.

QA Managers have independent on-site oversight of each plant and target key areas of risk for surveillance efforts. The QA Supervisor is embedded within the on-site organization, and is involved in on-site and off-site meetings to remain aware of key risks and issues impacting the project schedule, cost, and quality. QA Supervisors conduct periodic assessments of contractor work being performed and report results to site management and QA management for information and corrective actions. The QA Supervisor completes both planned and management requested audits of risk areas identified with the uprate project.

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<sup>9</sup> FPL Quality Instruction No. QI 7-PTN-5.

The QA Manager at each site for the uprate project is to complete a daily quality summary, and meets daily with management to address operational concerns with the project. Currently the QA Manager is completing an Oversight Plan for the uprates. This Plan will document specific risk areas to be audited at the St. Lucie and Turkey Point uprates. The Quality Manager is identifying key risks at each plant, and is expected to complete the Oversight Plan during the summer of 2008. FPL EPU Project Management notes that the EPU project is in its early stages, and has not used the quality documents at this time in the project.

In future years, audit staff expects to see increasingly frequent audit activity. Quality assurance audits and internal audits should provide adequate depth and breadth of coverage to support the company's cost recovery filings by documenting adequacy of internal controls, adherence to procedures, and reasonableness of project management efforts.

**FPL's internal audit effort for the uprates is in the early stages, but the structure and plans for the audit function appear adequate. As the project progresses, frequent internal audits and quality assurance audits will be necessary to ensure successful completion of the uprates.**

## 3.0 Turkey Point Units 6 & 7 New Construction Projects

### 3.1 Project Planning

#### **Was the company site selection process for Turkey Point Units 6 & 7 reasonable?**

According to FPL, during the summer of 2006, a core project team was formed and FPL initiated several key investigations to consider project activities for the proposed addition of two new nuclear generation units. These investigations included, site analysis, project organization, transmission integration, project scheduling and budget development.

In the third quarter of 2006, FPL contracted with Enercon Services, Inc. to conduct a site selection analysis and to prepare an alternate site analysis for a nuclear power project in the state of Florida. The project, known by FPL as Project Bluegrass, considered all existing FPL generation sites, and 15 additional sites, as potential locations for two potential new nuclear generation units. By the end of 2006, the study was completed. According to FPL, the Site Analysis Study combined with site specific investigations, led to the selection of the existing Turkey Point site as the best location for the two new nuclear units.

Some of the major considerations for the proposed site location were:

- ◆ Site proximity to high load demand
- ◆ Proximity to land and water delivery
- ◆ Adequate land for future expansion of the two new units
- ◆ Strong base foundation to support plant and other facilities
- ◆ Proximity to other company generation units allowing for shared infrastructure

FPL studied its system load characteristics and concluded that the system would benefit if the new units were close to the high load demand center of Miami/Dade, Broward, and Palm Beach counties. These Southeast Florida counties are heavily populated, and they represent a large portion of FPL's increasing electrical load demand. The close proximity of Turkey Point to these high load populations places the new generation source close to the markets having the heaviest requirements.

FPL considered the new units' proximity to available transportation routes to support large equipment delivery and the increased work force required for constructing the units. Sufficient company-owned land for the two new units exists at the Turkey Point site. FPL noted that the same advantages that had led it to select the Turkey Point site for its earlier fossil and nuclear units met the current needs for expansion. FPL's study concluded that the Turkey Point site provides advantages for deliveries of plant equipment via land and water, since the current plant site is located close to U.S. Highway 1 by land and to Biscayne Bay by water.

FPL management notes that the current Turkey Point site was initially planned to support six nuclear units, when the property was purchased years ago. FPL believes that multiple

generation units within the same site may allow sharing of some plant infrastructure costs. FPL has considered the potential effects of the two new nuclear units on existing Units 3 & 4, and has determined that if an accident occurs at one unit it will likely be contained without impacting the other units at the site. Regarding site selections involving multiple units, the NRC requires the utility to determine whether the reactors are independent so that an accident in one reactor would not cause an accident in another, and to show that simultaneous operation of multiple reactors will not put public safety at risk.<sup>10</sup> FPL notes that the NRC approved reactor design is such that it will contain an event within the containment facility and not impact other units on the site. The NRC includes this consideration in its certification of reactor technology. Therefore, NRC approved reactors have already been certified to meet these requirements. FPL also states that the requirement is satisfied within the Combined Operating License Application (COLA) submittal to the NRC.

The Turkey Point site is located on a deep base of limestone that is likely to provide a strong foundation for the reactor containment building, turbine generator facilities, feed water heaters, cooling systems, and other supporting plant facilities. Approximately 4,000 employees and contractors will be on-site for plant construction at its high point. FPL believes the additional property at the site will allow the company to create additional parking areas to accommodate workers, or allow the company to create staging areas to bring workers back and forth to the plant each day.

Additional site logistics and needs, such as fill dirt and cooling water, are being studied by FPL. The new Turkey Point site will have to be raised approximately 20 feet to bring the new units to the same grade as the existing units, and will provide the foundation for the new reactor containment buildings and plant support facilities. To accomplish this task, millions of tons of phosphate rock fill will be brought to the site. FPL is examining the use of on-site fill capabilities to help supplement the fill being brought in by off site sources. The company is also pursuing the use of reclaimed water from Dade County, and other practical sources, to help meet the requirement of millions of gallons of water used daily by the new plants. FPL knows that it must also consider the infrastructure and roads needed to support the construction of the new units at Turkey Point. As each new challenge arises, FPL includes them into the project schedule to assure the site is prepared and ready for construction, once licensing approval has been received.

**FPL's site selection process appears to have been reasonable and in keeping with good business practices.**

### **Was the process for plant design selection of the new Turkey Point Units 6 & 7 reasonable?**

FPL began its process of identifying the project technology by completing a technical analysis of nuclear reactor designs available in the industry. FPL originally studied five primary

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<sup>10</sup> Title 10, Code of Federal Regulations 100.11

reactor technology options. FPL management said that, in addition to technological considerations, FPL's analysis included the following three key selection criteria:

- ◆ The capital cost of total construction
- ◆ The vendor's ability to manage cost and schedule risk throughout the project
- ◆ The execution capabilities of the Vendor/Engineer/Constructor that would construct and commission the project

Reviewing the benefits of each technology and the associated vendors, FPL narrowed the best-suited nuclear technology choices to two: the General Electric ESBWR and Westinghouse AP1000. FPL's analysis ultimately identified the Westinghouse AP1000 as the most practical and cost effective selection for FPL.

FPL chose the Westinghouse AP1000 technology as its preferred reactor technology design because it has received certification by the NRC, employs a proven pressurized water reactor technology, and includes an advanced passive design safety system. The General Electric ESBWR is under consideration for design certification by the NRC, but as of June 2008, this designation had not yet been granted.

To verify the reasonableness of its approach to the technology decision, FPL engaged MPR Associates, Incorporated to check its technology selection logic. After reviewing FPL's process to arrive at a technology selection, MPR concluded that FPL assessments and considerations were appropriate and support their decisions to date.

**FPL's plant design selection process was reasonable and effective in positioning the company to meet the anticipated need for capacity in 2018.**

### **Is FPL's approach to negotiating an engineering, procurement and construction contract for the new Turkey Point Units 6 & 7 reasonable?**

Based on current information, FPL believes it is likely to be about the fifth U.S. utility to begin construction of a Westinghouse AP1000 reactor design. FPL believes the company will benefit from the early wave of AP1000 construction projects. Company management views this position as advantageous, since first-of-a-kind production can involve considerably more risks. These factors may allow the company time to negotiate cost savings in its engineering procurement and construction contract for Turkey Point Units 6 & 7.

FPL is currently negotiating with the team of Westinghouse and Shaw Stone & Webster (SS&W) to develop an engineering and procurement contract for the project. In the meantime, FPL management has chosen to delay its decision on a construction contractor while evaluating its options. FPL does not believe this will result in delays for the overall project schedule, and may still opt to use the combined Westinghouse/SS&W team for engineering, procurement and construction.

The company states that it has historically used this approach to vendor contracting, and notes that it is a conservative means to stimulate competition for project services. Some utilities may be seeking the full range of engineering, procurement, and construction services, through an Engineer Procure and Construct contract. However, FPL notes that viable alternatives exist to selecting SS&W to construct the units. Exploring these alternatives may allow FPL to obtain construction services at a lower cost by motivating SS&W to reduce its price. FPL also points out that it is not irreversibly tied to the AP1000 technology selection at this early date.

FPL has secured a manufacturing slot during 2008. FPL is considering a request to the NRC for a Limited Work Authorization that would allow it to perform limited construction on the Turkey Point site for Units 6 & 7. Major safety-related Unit 6 & 7 construction is not expected to begin until mid 2012 or 2013.

**FPL's development of the option to consider separate contracts for project construction and for engineering and procurement may reduce total construction costs. FPL should continue to evaluate the impact of the timing of contractor selection on the overall project schedule.**

### **What regulatory approvals are required for completion of the project?**

The most important federal approval for FPL's new Turkey Point Units 6 & 7 comes from the NRC. A Combined Operating License Application (COLA) approval provides NRC authorization for both the construction and conditional operation of a nuclear power facility. The COLA is the long-lead regulatory item in the completion of Turkey Point Units 6 & 7.

On November 16, 2007, FPL awarded Bechtel Power Corporation a contract to complete the COLA for Turkey Point Units 6 & 7. FPL estimates two years for the NRC review, including an additional year of public meetings and review, for a lead time of between 36 and 42 months for the COLA approval. FPL notes that it has a tight COLA completion schedule, but is working toward completion of the application by March 2009. FPL indicates that there may be fiscal year 2009 budget constraints at the NRC, which could delay COLA applications submitted after October 31, 2008. FPL says that COLA applications are taken in the order of submittal to the NRC, and are docketed after that date. FPL believes application submittals after October 1, 2008 may be slowed for NRC review. FPL is estimating a 42-48 month approval window, if there are potential delays in the start of the review.

FPL and other NuStart member companies have sponsored the development of the Tennessee Valley Authority's Bellefonte COLA as a reference to streamline the NRC approval process for other member companies. NuStart is a consortium of nuclear power companies that have joined together to sponsor a reference COLA for the Westinghouse AP1000. The reference COLA will reduce processing time for subsequent AP1000 applications. The NRC will approve all generic AP1000 COLA chapters once, and then will separately approve the customized chapters for each proposed unit.

On a state level, FPL is developing input for state licensing and permitting requirements for the Florida Department of Environmental Protection (FDEP). State environmental permitting takes approximately 15 months, and is ultimately approved by the Power Plant Siting Board, including the Governor and Cabinet, or in a non-contested case, by the Secretary of the Department of Environmental Protection on behalf of the Board.

The company must ensure continued compliance with that department's regulatory requirements under the addition of increased power levels and operations at the Turkey Point site. In addition to the COLA submittal, FPL has contracted with Bechtel Power Corporation to complete a cooling water study to identify and evaluate alternative circulating water systems for the two new units to be constructed at the Turkey Point site. FPL's cooling towers will be designed to reduce the discharge temperature range to permitted levels, additional permit information and communication with the FDEP regarding the environmental impact and tower placement will be necessary.

Another state regulatory requirement is the submittal of a Petition of Need to the Florida Public Service Commission. Before proceeding with the construction of any new generation facilities in Florida, Section 403.519(4), Florida Statutes, requires the Certificate of Need to be approved. After consideration of FPL's petition for need determination, for the addition of Turkey Point Nuclear Units 6 & 7, in Docket No. 070650-EI, the Florida Public Service Commission gave its approval.

Among the issues reviewed in the FPSC Need Determination Hearing was FPL's advanced forging reservation payment to Westinghouse. The Commission was in agreement with FPL and OPC that all specific contractual terms, including price, portability, and other compensating aspects of such payments would be the subject of the prudence review in future Nuclear Cost Recovery Clause proceedings.

**FPL has appropriately proceeded with the required regulatory approvals, scheduling, and preparation of applications in a manner that will accommodate the planned project completion dates.**

**Has FPL developed a project plan to meet the desired project completion date?**

As the project matures, FPL will transition through different steps of development of its schedule and budget. Ultimately, the project schedule and budget will transition from a Level I preliminary stage to a more detailed and refined Level II budget, and then to a final Level III schedule and budget. Currently FPL is working toward completing a Level I budget and has begun working on the COLA application. As additional engineering studies and detailed feasibility scoping reviews are conducted, the schedule will advance to a Level II and a Level III schedule. FPL states that a Level III schedule and budget will require the monitoring of between 25,000 and 35,000 project activities.



The schedule and costs for Turkey Point Units 6 & 7 are monitored and tracked by the Project Controls Group, and are reported weekly and monthly to executive management. While no construction has been completed at this time, FPL continues to assess and re-assess the scheduling of activities supporting the successful implementation of Turkey Point Units 6 & 7. Scheduling for project activities is completed through the use of Primavera scheduling software. Primavera allows FPL Project Management and Plant Management to daily monitor and report the schedule status. It also allows Project Management to adjust the schedule as needed.

In the early stages of the Turkey Point Units 6 & 7 project, FPL is primarily involved in preliminary site work, including gathering geological and meteorological data for licensing submittals. Major studies and preliminary work currently underway include the following:

- ◆ Securing the AP1000 manufacturing slot
- Development of plant operator training curriculum
- ◆ Completion of the cooling water use study
- ◆ Completion of Transmission studies

FPL has recently secured a manufacturer's slot for the AP1000. During the remainder of 2008, FPL expects to complete additional work and negotiations on the project construction contract and to develop site prep work scope for the 2011 site activity. As mentioned earlier, safety-related construction is not expected to begin until 2013, after the COLA and site preparation work phases are completed.

In the interim, FPL states that it must plan for plant operator training. The AP1000 Owners Group (APOG) will likely coordinate the training for the new plants. The first steps are the development of training curriculum and the "training of the trainers." Once the curriculum has been developed, it will take approximately three and a half years to train the new operators for Turkey Point Units 6 & 7.

FPL has completed transmission studies and assessments for both the uprate and the new Turkey Point Units 6 & 7. Route studies are under way for the transmission lines to serve the new Turkey Point units. The technical studies of system lines, the sizing of lines, transformers needed, and connection of the plant generator(s) to the transmission system have been performed. These studies are further assessed for overall constructability, reliability, maintainability, and potential risk of off-site power loss to the generating unit(s). Based on when the project is needed, the scoping, scheduling, engineering, and construction resources to complete the project are determined.

FPL states that for Turkey Point Units 6 & 7, two of three transmission studies have been completed. The transmission studies are being conducted to assess the detailed requirements of taking transmission from the plant to different substation locations. According to FPL, the studies of different alternatives for the new Turkey Point Units 6 & 7 should be completed by the end of 2008. The results of the 2008 facilities route studies will go into the FDEP site certification submittal in 2009. FPL states that the project budget and schedule will be revised as the transmission route costs and construction schedule for the approved route become clearly defined.

FPL is currently studying the technical and economic considerations of water use for cooling the new units. FPL is reviewing the possible use of treated wastewater for a portion of its system cooling needs. The company is negotiating with Dade County to use treated wastewater as a source of cooling water for the new units. FPL is also considering the need to modify infrastructure to and from the Turkey Point Units 6 & 7 plants, including the widening of roads and bridges. During the construction phase of the project, FPL will need expanded parking and transportation facilities to accommodate the large influx of workers on site. The company has scheduled studies of the possible alternatives for modifying infrastructure and providing additional site access for construction workers for the construction phase ahead.

**FPL has taken a reasonable approach to developing project schedules at this early stage.**

### **Was FPL's risk evaluation for the Turkey Point Units 6 & 7 project reasonable?**

Since the development of the initial *Project Plan for New Nuclear Power Generation*, completed in September 2006, FPL has been assessing the risks associated with the Turkey Point Units 6 & 7 project. According to FPL, the scope of the project plan was limited to the development, submittal, and support of the NRC review of the COLA. The company noted that the scope of the project included site selection, technology selection, and the evaluation of associated project risks. These risks included water source, potential litigation, accuracy of cost projections, supply chain constraints, and technical due diligence. FPL's Project Management procedures require such a project risk assessment to be included when the project is sent to executive management for approval.<sup>11</sup>

FPL evaluated the risks associated with each site location in its site selection study, and chose the existing Turkey Point site as the best solution for locating the two new nuclear units. FPL considered and evaluated the risks associated with over 15 greenfield locations, in addition to its existing power generation sites, to identify Turkey Point as the optimum location for the new units.

To address the risk of potential regulatory approval delays, FPL has structured the Project Development organization described in Section 3.2 below. Project Development focuses on project management, state regulatory, and non-NRC licenses and approvals.

FPL also identified the potential risks of not providing for additional generation power, fuel diversity, and meeting its required regulatory reserve margin of 20% for system reliability. FPL's load forecast considered the risks associated with not moving forward with new generation capacity at this time. The company also evaluated the associated risks and costs of using fuels other than nuclear power, and determined other alternatives as being less cost effective to both its customers and the company.

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<sup>11</sup> FPL Nuclear Division, Nuclear Administrative Procedure 401, page 15 of 59.

FPL has evaluated and considered the risks associated with the selection of its reactor technology for the two new units, and has had that decision evaluated by an independent nuclear industry consultant to assess the decision's reasonableness.

FPL has also considered the risk of selecting an engineering, procurement, and construction contractor. Due to its position within the nationwide queue of new unit construction, the company has elected to move carefully in selecting a contractor that may be stretched thin by the challenge of simultaneously building several units. This approach may allow FPL to assess the status of other plant construction underway before making this important decision.

The company has followed a step-by-step approach to evaluating the impacts of increased costs, schedule delays, and resource limitations on the project success. FPL has also adopted the concept of using an "off ramp" from the project, as a means of analyzing whether the project should continue. In the event severe project delays or severely increased costs no longer support the project cost effectiveness, FPL is prepared to delay the project or take an off ramp to stop the project.

As described in earlier sections of this report, additional project risks and alternatives will continue to be assessed by FPL, through detailed scoping and feasibility studies. Each phase of the project will require FPL to evaluate risks associated with new challenges and alternatives. In addition, FPL's Risk Committee and senior management level committees review the status of the project as needed, and provide project oversight.

FPL cannot eliminate the risks inherent in completing a project such as Turkey Point Units 6 & 7, but it can manage and mitigate them. In addition to FPL feasibility studies, vendor scoping studies, and consultant studies, FPL has established daily, weekly, and monthly reports to management for monitoring the progress of the project. These ongoing reports include monthly at-a-glance project risk assessments and project status updates. The combination of these and other controls discussed in this report indicate that a satisfactory and reasonable level of project risk assessment and evaluation is completed by FPL.

**FPL has to date taken reasonable steps to identify, evaluate, and mitigate project risks associated with successful completion of the Turkey Point Units 6 & 7 project. Successful project completion will require continued vigilance in risk management and re-assessment of project viability at key decision points.**

## 3.2 Project Management and Organization

### **Is an appropriate project management organization in place for the Turkey Point Units 6 & 7 project?**

FPL has established a separate project organization for the oversight and management of Turkey Point Units 6 & 7. As shown in **Exhibit 3**, the organization consists of two key groups, Project Development and New Nuclear Projects. Project Development is headed by the Senior Director Project Development, and it has the overall responsibility for the management and organization of the project. It is focused on overall project management, state regulatory processes, environmental services, transmission planning, and non-NRC licenses and approvals.

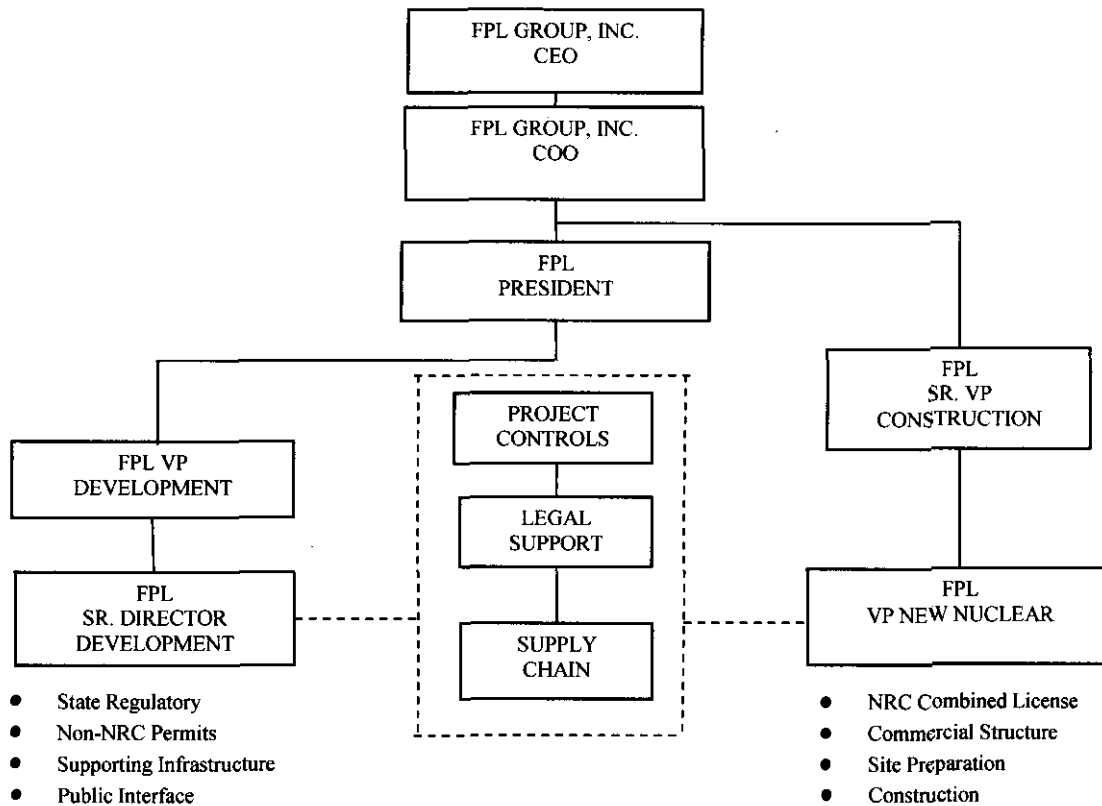
The Vice President of New Nuclear Projects, within the Construction and Corporate Services organization, leads the portion of the new organization responsible for managing the COLA, project engineering, procurement, site preparation, and construction activities.

Both the Project Development and New Nuclear Projects organizations share the same Project Controls Group, Legal and Supply Chain support. The Project Controls Group tracks the schedule and budget status for the new nuclear units, completes regular updates and status reports on the projects, and provides financial data associated with the project budget. The legal support organization assists in the areas of cost recovery, land use, and NRC licensing. The Supply Chain organization provides support for contract development and negotiations, RFP bid processing, procurement, contract administration and contractor evaluation. The new Turkey Point Units 6 & 7 project organization consists largely of FPL employees that have previous experience in power plant projects and ongoing plant operational experience.

The company states that it leverages its many years of successful power project development and construction, and approaches the Turkey Point Units 6 & 7 project with an understanding of the power plant Project Management process that has been tested in other large construction projects. FPL is still currently staffing the new project organization and building the project schedule and budget for the project.

**Effective oversight by the Turkey Point 6 & 7 Project Management organization will be an essential element to success. Though still being staffed, the Project Management organization appears to be appropriately structured and managed.**

## FPL NEW NUCLEAR ORGANIZATION



**EXHIBIT 3**

*Source: DR-5.8*

### **Are appropriate oversight and accountability controls over project management in place?**

The new organization structure for Turkey Point Units 6 & 7 uses a matrix approach to managing the project. Oversight and accountability of Project Management is shared with the Senior Director Project Development, the VP New Nuclear Projects and the Senior VP Construction, having direct reporting responsibility for the Project Controls Group. Support functions serve both the VP New Nuclear Projects and the Senior Director Project Development. Oversight of the VP New Nuclear Projects and the Senior Director Project Development is provided by the VP Construction and the VP Development, who in turn report to the Chief Operations Officer and the President.

FPL states that it uses a series of weekly, monthly, quarterly, and as-scheduled meetings to assess project status, to evaluate key risk areas, and to examine where the schedule and budget are, at that point in the project. The Corporate Risk Committee provides comprehensive reviews of major projects and discusses potential risks, on an as-scheduled basis. The Corporate Variance Report is used to monthly assess the project budget and variances. The Operating Committee, comprised of FPL senior management, provides oversight and direction for major

company projects and initiatives on an as scheduled basis. FPL's Board of Directors reviews and approves major strategies, financial objectives, and plans of the Company as-scheduled, and from time to time is updated on the new project.

Other meetings that FPL states provide oversight and accountability for the project include the following:

- ◆ Monthly Coordination Meetings between the New Nuclear and Project Development groups used to discuss and coordinate activities for the organization
- ◆ The Bechtel Monthly COLA Project Review Meeting gives FPL managers a review of where the vendor is in completing the COLA licensing effort
- ◆ Monthly Senior Management Vetting Sessions held with senior management meeting to vet and discuss current project status, key activities, and project issues
- The Due Diligence Report is a quarterly report summarizing project status and potential challenges.
- ◆ Weekly Development Meetings to provide the status of project activities and highlight project issues
- ◆ Monthly Project Review Meetings to provide a comprehensive project report covering status, budget, costs, performance, permitting, safety and potential risk

The Project Controls Group will continue to assist both sides of the organization with Project Management information and provide executive level reports for updated project status and cost updates. Additionally, executive and senior management oversight through the meetings and committees listed above will provide adequate oversight and accountability reviews for the new Turkey Point Units 6 & 7 project.

**Reporting tools for the new organization are still being completed, but thus far appear to provide adequate project oversight.**

### **3.3 Cost and Schedule Monitoring Controls**

**Has FPL developed an adequate control system for monitoring project schedules and costs?**

As already discussed, the Project Controls Group monitors the project schedule and budget. The Project Controls Group is led by the Manager Construction/Business Services, responsible for reporting the monthly project financials to Turkey Point Units 6 & 7 project management and FPL executive management. The monthly financial view is reviewed in Monthly Project Meetings, including executive management. The Manager Construction and Business Services also provides monthly views of the approved budget versus actual costs, a

cash flow forecast to actual view, and answers specific management requests for financial reporting data.

The Project Controls Manager supports the organization by reporting the weekly and monthly project schedule status. A monthly at-a-glance view of the project is provided to executive management to keep them aware of the project progress and performance measurements. The at-a-glance report summarizes key project events, provides a summary status and indicates potential risks associated with the project.

The Project Controls Group conducts monthly meetings to review contractor performance and adherence to the schedule. Weekly contractor update calls are also conducted on Mondays to determine whether there are any contractor problematic areas to complete for the week. Critical path events and scope changes affecting the schedule are also monitored by the Project Controls Group. The Risk Tracker program provides updates of project primary risks to identify possible mitigates and assure unauthorized cost overruns do not occur.

The Project Controls Group tracks all scope changes on a trend ledger which indicates the number of changes and dollars for scope changes for each vendor. For instance, the COLA vendor issued scope changes due to the wet site conditions at Turkey Point Units 6 & 7, which slowed the core boring work for the COLA. While this had short term impacts to the schedule, the scope changes did not impact the long term completion schedule. This information is provided to executive management in update meetings to keep them informed. The Project Controls Group also monitors vendor contracts and amendments against vendor performance and vendor invoicing to assure vendors are paid only for work completed satisfactorily.

**Cost and schedule monitoring controls specific to Turkey Point Units 6 & 7 are still in the process of development. Limited results are available for assessing the adequacy of these controls at this time.**

### **3.4 Contractor Selection and Management**

**Has FPL's selection of the current set of contractors and vendors been reasonable?**

FPL Integrated Supply Chain maintains established vendor lists to use for competitive bidding situations. FPL nuclear procedures require departments and project teams desiring to issue a Request for Proposal to go through the Integrated Supply Chain organization. Procurement policies and procedures require that all sole source and single source contracts be supported by written justifications.

**Turkey Point Units 6 & 7 Project  
 Contracts Greater Than \$1 Million 2007-2008**

<b>Comensura</b>	Corporate supplier of contract personnel	<b>12/21/06</b>	Single Source	<b>Firm Fixed Percentage</b>	\$1,611,731	<b>\$2,541,093</b>
<b>Bechtel Power Corporation</b>	Development of Combined License Application	<b>11/16/07</b>	Competitive	<b>Time and Materials/ Target price with incentive</b>	\$26,064,451	<b>\$27,736,274</b>
<b>NuStart Energy Development, LLC</b>	Preparation of Reference Combined License Applications for Westinghouse and GE Designs	<b>4/18/04</b>	Membership Agreement	N/A	\$1,000,000	<b>\$3,000,000</b>
<b>Total</b>					<b>\$28,676,182</b>	<b>\$33,277,367</b>

**EXHIBIT 4**

*Source: Schedule AE-8*

FPL has selected three contractors for Turkey Point Units 6 & 7 with contracts greater than \$1 million. As shown in **Exhibit 4**, Comensura (now known as Guidant) provides contract personnel services under an existing master contract. FPL's justification for using Comensura was that the company has operated and managed the Managed Service Provider program for FPL Human Resources, and it has performed well.

The Bechtel Power Corporation contract for preparing FPL's COLA was a competitive bid award. FPL received two bids for this contract.

The contract with NuStart Energy Development LLC is a membership agreement in an industry organization. As noted, through cooperative efforts potential AP1000 owners are attempting to reduce costs through standardization of COLA submittal, training, and other activities.

FPL has not yet submitted a contract for the engineering, procurement, and construction of Turkey Point Units 6 & 7. FPL is negotiating a contract with Westinghouse-Shaw Stone & Webster for the engineering and procurement portions of the project. As discussed previously, FPL is considering using another contractor to build the new units.



**FPL appears to have followed its contractor selection procedures. Given the unique challenges and circumstances of the nuclear industry, FPL's use of sole source selections for the new Turkey Point Units 6 & 7 project to date is in keeping with reasonable business practices.**

**Is an appropriate set of internal controls for contractor management and evaluation in place for the Turkey Point Units 6 & 7 project?**

The Integrated Supply Chain maintains vendor performance statistics for selected major vendors, and manages non-safety-related contracts. For long-term vendors, contractor reviews are conducted quarterly or semi-annually. If FPL experiences a problem with a non-safety-related vendor, Integrated Supply Chain works with the Risk Department to remedy the situation.

Safety-related contractors are evaluated through Quality Assurance (QA) audits. These audits examine whether the vendors QA program for on site operations is compliant with the NRC QA requirements and FPL's own QA requirements. If the contractor QA program is not in compliance, it must be revised accordingly before beginning any work on site.

The assigned Integrated Supply Chain Contract Manager is responsible for evaluating the overall vendor work performance of each major contractor while on site. The Technical Representative assigned to each contractor is responsible for assessing the contractors performance and reporting any problems arising with the vendor while on site. Additionally, the Project Controls Group conducts monthly meetings to review contractors' performance and adherence to the schedule. Weekly contractor update calls are conducted on Mondays with contractors to determine whether there are any anticipated contractor problem areas. Critical path events and scope changes affecting the schedule are also monitored and reported through the Project Controls Group. FPL has previously established procedures for monitoring and evaluating contractor performance on the plant site. However, as the Turkey Point Units 6 & 7 project continues to progress, and more contractors begin work, the contractor management and evaluation controls should be reviewed and audited to evaluate their effectiveness.

**FPL's approach to contractor oversight and evaluation appears to be appropriate to date. Proactive project management by FPL should require frequent communication and updates, demand contractor accountability, and challenge information provided by contractors.**

**Has FPL implemented appropriate protections from contractor cost overruns or poor performance on the Turkey Point Units 6 & 7 project?**

In addition to the contractor management and evaluation process previously discussed, FPL has structured its contracts and purchase orders to identify specific scope, deliverables, completion dates, terms of payment, operational terms and conditions, reports from the contractor, and work quality specifications. Standard contract terms include suspension/termination for cause or suspension/termination for convenience address the conditions under which a contractor's services may be suspended or terminated. Limit of

Liability clauses specify the obligations of the company and the contractor under specific conditions and situations. Contract clauses addressing changes to scope of work and schedule changes state the conditions under which changes to work scope will be accomplished. These and other FPL contract provisions help ensure contractors perform work on time as specified.

FPL has also attempted to ensure contractor management through the use of fixed-price and target price contracts where possible. FPL uses fixed price contracts where a well-defined scope of work can be specified, with specific deliverables. Target price contracts are used to limit the price for work with variable scopes, scope modifications, or additional scope work may be assigned. FPL uses time and materials contracts when the timeframe and scope of work is less certain.

FPL's Bechtel contract for Phase I of the COLA development uses a target price approach. The compensation section of the Contract for Development of the Combined Operating License Application, provides a target price for Phase I with performance incentives, and an at risk value of based on contractor performance in the areas of cost, schedule, quality, and safety. Based on the level of performance in each area, the contractor either receives an incentive for achieving performance or pays FPL a portion of the at risk dollars for not reaching performance milestones. Any change in scope requiring a change order that impacts the target price, the parties will determine an adjustment to the incentive and at risk value.

Since the types of services and volume of work provided under the Comensura contract are variable, this contract is structured on a time and materials basis. Separate purchase orders control the amount and types of work requested by FPL.

FPL procurement procedures state that, in the event contract scope changes occur, the contract or associated purchase order must be reflective of the scope changes. FPL also monitors contractor scope change trends to manage contractors excessively requesting modifications of scope for possible company action. These requirements add further management review points to assess whether the contractor is performing to contract specifications.

FPL has established Nuclear Engineering and Construction procedures to guide personnel in monitoring and evaluating contractors' performance. As explained previously, FPL contractor management is completed at both the site and staff level. FPL states these controls will be reviewed periodically, when necessary to reflect changing control needs and conditions of the project.

**FPL has made efforts to ensure effective contractor performance by means of contract provisions and structure. This approach appears to appropriately seek control of contract costs through the use of contracts structured to encourage contractor performance.**

### 3.5 Auditing and Quality Assurance

#### **Does FPL have appropriate auditing and quality assurance functions in place for the Turkey Point Units 6 & 7 project?**

The first internal audit of the Turkey Point Units 6 & 7 project was scheduled to begin in June 2008. The audit was planned to focus on expenditures to date for the new units, and is expected to be complete by September 2008.

In addition to the FPL Internal Audit financial and operational audits, Quality Assurance (QA) completes Vendor Audits and Contractor Performance Evaluation Reports for safety-related contractors. Quality Instruction No. QI 7-PTN-5 states that once the contractor is on site, the QA Manager should review the contractors QA program procedures and personnel qualifications. FPL has a separate QA Manager responsible for Turkey Point Units 6 & 7 to identify and conduct QA audits.

FPL Quality Instructions note that the QA Manager should review contractor on site procedures for compliance with FPL's QA Program commitments, and any special certifications required for contractor compliance with FPL committed codes. Quality Instructions state that, the QA Manager coordinates the resolution of any contractor conflicts with the Quality Program. The QA organization also performs audits or surveillances on safety-related and quality-related services where they are performed under the contractor's QA Program.

The QA Manager for the new Turkey Point units will complete a daily quality summary, and meet with management to address operational concerns with the project. The Quality Manager is responsible for identifying key risks at each plant and for completing on-site evaluations of contractors' QA programs.

FPL's QA organization also participates in Nuclear Procurement Issues Committee (NUPIC) sponsored supplier audits. NUPIC is a nuclear industry organization that conducts audits with member companies to evaluate suppliers furnishing safety related products and services to the industry. Many of the same vendors that FPL uses in both the uprates project and the new Turkey Point Units 6 & 7 have been the subject of a NUPIC audit in the last three years.

In future years, audit staff expects to see increasingly frequent FPL audit activity. Quality assurance audits and internal audits should provide adequate depth and breadth of coverage to support the company's cost recovery filings by documenting adequacy of internal controls, adherence to procedures, and reasonableness of project management efforts.

**The audit effort for Turkey Point Units 6 & 7 is in the very early stages, but the structure and plans for the audit function appear adequate. As the project progresses, more frequent internal audits and quality assurance audits will be necessary to ensure successful completion of Turkey Point Units 6 & 7**