

State of Florida



## Public Service Commission

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TALLAHASSEE, FLORIDA 32399-0850

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

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**DATE:** July 20, 2010  
**TO:** Ann Cole, Commission Clerk, Office of Commission Clerk  
**FROM:** Keino Young, Senior Attorney, Office of the General Counsel  
**RE:** Docket No. 100009-EI - Nuclear Cost Recovery Clause

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*Key*

Please find attached for filing in the above-referenced docket are the original and six copies of the Direct Joint Testimony of WILLIAM COSTON and KEVIN CARPENTER, on behalf of the Commission Staff.

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DOCUMENT NUMBER-DATE

05929 JUL 20 2

FPSC-COMMISSION CLERK

1                   **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2                   **COMMISSION STAFF**

3                   **DIRECT JOINT TESTIMONY OF WILLIAM COSTON AND KEVIN CARPENTER**

4                   **DOCKET NO. 100009-EI**

5                   **JULY 20, 2010**

6  
7           **Q.     Mr. Coston, please state your name and business address.**

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

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

11          A.     I am employed by the Florida Public Service Commission as a Government Analyst II,  
12          within the Office of Auditing and Performance Analysis.

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

14          A.     I perform reviews and investigations of Commission-regulated utilities, focusing on  
15          the effectiveness of management and company practices, adherence to company procedures,  
16          and the adequacy of internal controls. Mr. Carpenter and I jointly conducted the 2010 review  
17          of Progress Energy Florida's project management internal controls for the extended power  
18          uprate project at the Crystal River Unit 3 and Levy Nuclear Project.

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

20          A.     I earned Bachelor of Arts and Master of Public Administration degrees from Valdosta  
21          State University in 1993 and 1995, respectively. I have worked for the Commission for seven  
22          years conducting operations audits and investigations of regulated utilities. Prior to my  
23          employment with the Commission, I worked for six years at Bank of America in the Global  
24          Corporate and Investment Banking division.

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

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FPSC-COMMISSION CLERK

1 A. Yes. I filed testimony in Docket No. 090009-EI. This testimony concerned the 2009  
2 audit of Progress Energy Florida's (PEF) project management internal controls for the nuclear  
3 plant uprate at the Crystal River Unit 3 and Levy Nuclear Project. Additionally, in 2005 I  
4 filed testimony in Docket No. 050078-EI. This testimony addressed an audit of distribution  
5 electric service quality for Progress Energy Florida's vegetation management, lightning  
6 protection, and pole inspection processes.

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

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

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

11 A. I am employed by the Florida Public Service Commission, as a Regulatory Analyst II,  
12 within the Office of Auditing and Performance Analysis.

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

14 A. I perform reviews and investigations of Commission-regulated utilities, focusing on  
15 the effectiveness of management and company practices, adherence to company procedures,  
16 and the adequacy of internal controls. Mr. Coston and I jointly conducted the 2010 review of  
17 Progress Energy Florida's project management internal controls for the nuclear plant uprate at  
18 the Crystal River Unit 3 and new construction underway at the Levy site.

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

20 A. I earned a Bachelor of Science in Business Administration degree from Concord  
21 University in 1981. I am currently enrolled as a graduate student at Florida State University,  
22 seeking a Masters in Applied American Politics and Policy degree. My background includes  
23 experience with the West Virginia State Tax Department and the Florida Department of  
24 Business and Professional Regulation. I also worked as an Accountant with a public  
25 accounting firm in Orlando, FL.

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

2   A.   No.

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

4   A.   Our testimony presents the attached audit report entitled *Review of Progress Energy*  
5 *Florida's Project Management Internal Controls for Nuclear Plant Uprate and*  
6 *Construction Projects* (Exhibit CC-1). This review was requested by the Commission's  
7 Division of Economic Regulation to assist with the evaluations of nuclear cost recovery  
8 filings. The report describes key project events and contract activities completed during mid-  
9 2009 through May 2010 for the Crystal River 3 Uprate project and the Levy Nuclear Project.  
10 The report also presents descriptions of the current project management internal controls  
11 employed by Progress Energy Florida.

12 **Q.    Please summarize the areas examined by your review.**

13       The Office of Auditing and Performance Analysis conducted a review of the internal  
14 controls and management oversight of the nuclear projects underway at Progress Energy  
15 Florida. This is an ongoing annual review that examines the organizations, processes, and  
16 controls being used by the company to execute the Extended Power Uprate of Unit 3 at the  
17 Crystal River Energy Complex and the construction of Levy Nuclear Plant Unit 1 and Unit 2.  
18 This is the third review of the company's controls for its nuclear construction projects. The  
19 first two reviews were filed in the 2008 and 2009 Nuclear Cost Recovery Clause Dockets  
20 before the Commission.

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

1 **Q. Please summarize your conclusions regarding the Levy Nuclear Project.**

2 **A.** The company made a decision in 2010 to shift the project in-service dates out to at  
3 least 2021 and 2022 for the two units. The company evaluated several options, including  
4 cancelation, when considering the future of the project. We recognize that several internal and  
5 external factors influenced the company's decision to shift its construction schedule for this  
6 project. Given the uncertainties facing the company, keeping the project progressing without  
7 further substantial investment is a reasonable approach at this point in time.

8 **Q. Please summarize your conclusions regarding the Extended Power Uprate**  
9 **Project.**

10 **A.** In 2009, PEF completed Phase II of the Extended Power Uprate (EPU) project at  
11 Crystal River Unit 3. Overall, the company anticipates the total EPU project cost to be \$479.4  
12 million (excluding AFUDC and joint owner commitments); representing a 12 percent  
13 increase from the original \$426.6 million estimates. During the fall 2009 outage, the company  
14 discovered a delamination within the wall of the unit's containment vessel. This was  
15 identified during the work to replace the unit's steam generators—a separate and independent  
16 project from the EPU. However, the delamination repair has extended the original outage  
17 through at least fall 2010 and will impact the EPU's phase III schedule—extending the project  
18 until at least 2012. We recommend the Commission monitor the EPU project for potential  
19 cost impacts resulting from scheduling delays caused by the delamination issue.

20 Also, in mid-2009, PEF made the decision to defer the installation of its two low  
21 pressure turbines from Phase II to Phase III work scope. Two factors influenced this decision:  
22 the turbines failing a quality assessment test, and the ability to adequately insure this turbine  
23 model. The company is currently negotiating a resolution with Siemens, the turbine  
24 manufacturer, to resolve the outstanding issues. We recommend that the Commission monitor  
25 the results of the Siemens turbine negotiations to ensure that PEF recovers all the appropriate

1 costs, and excludes any costs resulting from a possible vendor error.

2        Additionally, if the company chooses not to move forward with its current Siemens  
3 low pressure turbine selection, there will be a decrease in the final megawatt electrical (MWe)  
4 output for the project. If this occurs, an evaluation may be necessary to assess the appropriate  
5 handling of the reduction in planned versus achieved MWe output. In effect, the uprate would  
6 then have cost more per additional MWe. We recommend that the Commission monitor the  
7 appropriate handling of any reduction in planned versus achieved MWe output resulting from  
8 any change to the original turbine design option.

9        Prior to the company implementing the EPU changes, PEF must receive approval from  
10 the Nuclear Regulatory Commission to operate at the higher MWe output. This is achieved  
11 through an amendment to the company's current operating license. The company initiated its  
12 License Amendment Request application in 2007. In June 2009, PEF commissioned an  
13 "Expert Panel" to review its *Final Draft-CR3 EPU Licensing Report*. The panel determined  
14 that the application, as written, would not receive NRC approval, requiring the company to  
15 expend resources to strengthen the submittal. The company contracted with AREVA to  
16 complete the required restructuring/rewrite of the License Amendment Request (LAR) draft,  
17 and to complete additional engineering scope-related work for the LAR application. We  
18 recommend that the Commission consider whether the additional costs for the LAR  
19 restructuring/rewrite and the additional engineering scope by AREVA resulted from  
20 inadequate management oversight. This topic is discussed in greater detail in sections 3.1.1  
21 and 3.1.2 of Exhibit CC-1 included in our testimony.

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

23 A.     Yes, our audit report is attached as Exhibit Numbers CC-1.

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

25 A.     Yes.

JULY 2010  
REDACTED COPY

Docket No. 100009-EI  
Review of Project Management Internal Controls  
Exhibit CC-1, Page 1 of 74



REVIEW OF

Progress Energy Florida, Inc.'s  
Project Management  
Internal Controls  
FOR  
Nuclear Plant Upstate and  
Construction Projects

By Authority of  
The State of Florida  
Public Service Commission  
Office of Auditing and Performance Analysis

DOCUMENT NUMBER-DATE  
05929 JUL 20 2010  
FPSC-COMMISSION CLERK



*Review of*  
**Progress Energy Florida, Inc.'s  
Project Management Internal Controls for  
Nuclear Plant Update and Construction Projects**

**William "Tripp" Coston  
Government Analyst II  
Project Manager**

**Kevin Carpenter  
Regulatory Analyst II**

**July 2010**

**By Authority of  
The State of Florida  
Public Service Commission  
Office of Auditing and Performance Analysis**

**PA-10-01-001**



## TABLE OF CONTENTS

| <b>CHAPTER</b> |  | <b>Page</b> |
|----------------|--|-------------|
| <b>1.0</b>     | <b>EXECUTIVE SUMMARY</b>                             |             |
| 1.1            | Purpose and Objectives.....                          | 1           |
| 1.2            | Scope.....   | 1           |
| 1.3            | Methodology.....                                     | 2           |
| 1.4            | Observations.....                                    | 3           |
| <b>2.0</b>     | <b>LEVY NUCLEAR PROJECT</b>                          |             |
| 2.1            | Levy Key Project Developments.....                   | 7           |
| 2.2            | Levy Project Controls and Oversight.....             | 16          |
| 2.3            | Levy Contract Oversight and Management.....          | 27          |
| <b>3.0</b>     | <b>CRYSTAL RIVER 3 EXTENDED POWER UPRATE PROJECT</b> |             |
| 3.1            | EPU Key Project Developments.....                    | 37          |
| 3.2            | EPU Project Controls and Oversight.....              | 44          |
| 3.3            | EPU Contract Oversight and Management.....           | 54          |
| <b>4.0</b>     | <b>CONCLUSIONS</b>                                   |             |
| 4.1            | Levy Nuclear Project.....                            | 57          |
| 4.2            | Crystal River 3 Extended Power Uprate Project.....   | 58          |
| <b>5.0</b>     | <b>APPENDICES</b>                                    |             |
| 5.1            | Appendix A.....                                      | 61          |
| 5.2            | Appendix B.....                                      | 62          |
| 5.3            | Appendix C.....                                      | 63          |
| 5.4            | Appendix D.....                                      | 64          |
| 5.5            | Appendix E.....                                      | 65          |
| 5.6            | Appendix F.....                                      | 66          |
| 5.7            | Appendix G.....                                      | 66          |

## TABLE OF EXHIBITS

| <u>EXHIBIT</u>  | <u>Page</u> |
|---|-------------|
| 1. PEF Levy EPC Long Lead Material Purchase Orders.....                                   | 10          |
| 2. PEF Levy Nuclear Project Timeline .....  | 13          |
| 3. PEF Estimated Levy Project Cost Over Time .....  | 13          |
| 4. PEF Estimated Levy Project Cost-Revised April 2010 .....                               | 14          |
| 5. PEF Three-Year Estimated Expenditures for the Levy Project 2010-2012.....              | 14          |
| 6. PEF Planned Project Management Procedures for the Levy Nuclear Project.....            | 18          |
| 7. New or Revised Contractor Oversight and Management Procedures-Levy .....               | 19          |
| 8. Top-Tier Risks Identified—Levy Integrated Project Plan April 2010 .....                | 20          |
| 9. PEF Levy Internal Audits Completed during 2009 .....                                   | 23          |
| 10. PEF Levy Internal Audits Planned for 2010.....  | 25          |
| 11. PEF Levy Quality Assurance Audits Completed during 2009 .....                         | 26          |
| 12. PEF Levy Quality Assurance Audits Planned for 2010.....                               | 27          |
| 13. PEF Levy Nuclear Plant Generation Contracts Updated in 2009 .....                     | 28          |
| 14. PEF Levy EPC Contract Pricing Structure and Breakdown.....                            | 32          |
| 15. PEF CR3 Low Pressure Turbine Replacement Options and the<br>Resulting MWe Output..... | 42          |
| 16. New or Revised CR3 Contract Oversight and Management Procedures .....                 | 46          |
| 17. Created or Revised CR3 Nuclear Projects Guidance Documents 2009 .....                 | 48          |
| 18. PEF Risk Matrix .....   | 50          |
| 19. PEF Internal Audits Completed during 2009 for the EPU Project.....                    | 52          |
| 20. PEF s Internal Audits Planned for 2010 for the EPU Project.....                       | 52          |

## TABLE OF EXHIBITS

| <u>EXHIBIT</u>  | <u>Page</u> |
|---|-------------|
| 21. PEF Quality Assurance Reviews Completed by NOS in 2009 for the EPU Project .....        | 53          |
| 22. PEF Contracts Greater than \$1 million for the EPU Project as of December 31, 2009 .... | 54          |



## 1.0 Executive Summary

### 1.1 Purpose and Objectives

At the request of the Florida Public Service Commission's (Commission or FPSC) Division of Economic Regulation, the Office of Auditing and Performance Analysis performed a review of the internal controls and management oversight of the nuclear projects underway at Progress Energy Florida, Inc. (PEF or the company). This is the third year of a review in an ongoing FPSC oversight program to examine the adequacy of project management and internal controls employed in the company's Extended Power Uprate of Unit 3 at the Crystal River Energy Complex and the construction of Levy Nuclear Plant Unit 1 and Unit 2.

The primary objective of this review was to document project key developments and the organization, management, internal controls, and oversight that PEF has in place or plans to employ for these projects since the last NCRC hearing. Additional historical project detail can be referenced in the two previous reviews completed by FPSC audit staff in 2008 and 2009, and filed as testimony in Docket No. 080009-EI and 090009-EI, respectively. The information provided in this report may be used by Division of Economic Regulation staff to assist in an assessment of the reasonableness of the company's cost-recovery requests for the projects.

### 1.2 Scope

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

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

Internal controls are the vital mechanisms used by the company 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 established to prevent or control them. Prudent decision-making results from orderly, well-defined processes that address known risks, needs, and capabilities. Adherence to written procedures, effective communication, vigilant internal and contractor oversight, and ongoing auditing and quality assurance are essential to ensure that project costs are incurred prudently.

Specifically, according to Internal Control Integrated Framework designed by the Committee of Sponsoring Organizations of the Treadway Commission, an internal control should consist of five interrelated components. The components are:

- ◆ Control environment
- ◆ Risk assessment
- ◆ Control activities
- ◆ Information and communication
- Monitoring

The synergy and linkage among these components forms an integrated system which reacts to changing conditions. The internal control system must be intertwined with the entity's operating activities. When looking at the effectiveness and efficiency of operations, the reliability of financial reporting, and compliance with applicable laws and regulations, all five components must be present and function effectively to conclude the internal controls over operations are effective. This report will document the existence of each of these five components for PEF project management.

### 1.3 Methodology

Planning and research and initial data collection for this review were performed in January and February 2010. Additional data collection, site visits, interviews, analysis and report writing were conducted between March and May 2010. The information compiled in this report was gathered via company responses to staff document requests, visits to the Crystal River Energy Complex and interviews with key project personnel. Staff also reviewed testimony, discovery and other filings in Docket No. 100009-EI.

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

- ◆ Policies and procedures
- ◆ Organizational structures
- ◆ Contract request for proposals
- ◆ Contractor bids
- ◆ Bid evaluation analyses
- ◆ Contracts
- ◆ Project scope analysis studies by PEF and consultants
- ◆ Internal audit reports and quality assessment reviews

## 1.4 Observations

### 1.4.1 Levy Nuclear Plant

During 2009, the company evaluated the future of the Levy Nuclear Project and made a decision in 2010 to redirect the project focus from construction to regulatory approval. The company has delayed the project by a minimum of 60 months, pushing out the start of construction until at least 2015. The current focus is to obtain the Combined Operating License (COL) approval from the NRC and then re-evaluate the construction timeline. Because the company has an Engineering, Procurement, and Construction (EPC) contract with Westinghouse and Shaw, Stone & Webster (the Consortium) to start construction on the Levy project in 2012, the decision to shift the schedule required renegotiation of the terms of the contract.

During the company's reevaluation of the project schedule, it considered several scenarios ranging from a 24-month delay to full cancellation of the project. In the end, the company decided to shift the [REDACTED]. The company believes this will result in a shift in the in-service dates to 2021 and 2022 for the two units.

The company was successful in negotiating an amendment to its EPC contract with the Consortium incorporating this new schedule timeline. In doing so, PEF was able to [REDACTED]. The company will maintain [REDACTED]. In addition, the company was able to maintain the [REDACTED].

As a result of the schedule shift, the company has worked with the Consortium to address the outstanding contract purchase orders for its long-lead items. These purchase orders are for [REDACTED] major components at a total cost of approximately [REDACTED]. The company anticipates it will cost an additional [REDACTED] to finalize the disposition of these purchase orders. This cost is directly related to the shift in schedule.

PEF estimates that there will be an increase in total project costs as a result of the shift in schedule. In 2008, the company estimated the total project cost, excluding AFUDC, at [REDACTED]. The 2010 estimate, using the 2021/2022 in-service dates as its base, projects the total cost at [REDACTED]. This represents an approximate increase of [REDACTED].

Audit staff recognizes that several internal and external factors influenced the company's decision to shift its construction schedule for the Levy project. This was based on several key assumptions by PEF. First, the company's internal assessment that the project is still a viable and feasible option and that there is a standing determination of need issued by the Commission. Second, the delay in Westinghouse receiving NRC approval of its final design certification. Third, the economic downturn and recent lower capacity demand within the State. Last, the uncertainty in the proposed Federal carbon legislation.

**Given the uncertainties facing the company, audit staff recognizes that keeping the project progressing, without further substantial investment of cost, is a reasonable approach by PEF at this point in time.**

#### **1.4.2 Crystal River 3 Extended Power Uprate Project**

Overall, the company anticipates the total EPU project cost to be \$479.4 million (excluding AFUDC and joint owner commitments). This represents a 12 percent increase from the original \$426.6 million estimates. Through its Integrated Project Plan process, the company has documented the additional costs and received senior management approval to increase these expenditures over time. The company believes that this increase is within an acceptable range for a project of this size and complexity.

In 2009, PEF completed Phase II of the Extended Power Uprate project at the Crystal River Unit 3 during its scheduled refueling outage. The company states that all work was completed as scheduled and within the allotted budget. During the outage, the project team monitored the work performed for each major component and tracked variances and delays in the schedule. Audit staff reviewed these management reports and verified that the project remained on schedule with minor variances and no major issues were identified during the work.

During the same refueling outage, the company discovered a delamination within the wall of the unit's containment vessel. This was identified during the work to replace the unit's steam generators—a separate and independent project from the EPU. The delamination repair has extended the original outage through at least fall 2010. This extended outage will impact the EPU's Phase III schedule. Originally, the company planned to finish the EPU work scope during the next refueling outage, scheduled for fall 2011. However, PEF has shifted the outage to at least spring 2012.

**Audit staff recommends the Commission monitor the EPU project for potential cost impacts resulting from scheduling delays caused by the delamination issue.**

In mid-2009, PEF made the decision to defer the installation of its two low pressure turbines from Phase II to Phase III work scope. This decision required the company to spend [REDACTED] restructuring its Phase II work scope to accommodate this change. Two factors influenced this decision: the turbines failing a required quality assessment test and the ability to adequately insure this turbine model. The company is currently negotiating a resolution with Siemens, the turbine manufacturer, to resolve the outstanding issues. Also, the company is considering the following options for the turbine issue: continue operating CR3 with its current Alstom turbines, install the 18 square meter Siemens turbines during Phase III as originally designed, install the 18 square meter Siemens turbines during Phase III with the L0 blades removed, or install smaller 13.9 square meter Siemens turbines in 2013.

**Audit staff recommends that the Commission monitor the results of the Siemens turbine negotiations to ensure that the company recovers all the appropriate costs, and excludes any costs resulting from a possible vendor error.**

Additionally, if the company chooses not to move forward with its current Siemens low pressure turbine selection, there will be a decrease in the final MWe output for the project. If this occurs, an evaluation may be necessary to assess the appropriate handling of the reduction in planned versus achieved MWe output. In effect, the uprate would then have cost more per additional MWe added, and cost recovery adjustments may be warranted. The low pressure turbine issue is discussed further in Chapter 3.1.

**Audit staff recommends that the Commission monitor this issue to determine if it may be necessary to assess the appropriate handling of the reduction in planned versus achieved MWe output resulting from any changes to the original turbine design option.**

Prior to the company implementing the EPU changes, PEF must receive approval from the NRC to operate at the higher MWe output. This is achieved through an amendment to the company's current operating license. The company initiated its License Amendment Request application in 2007. In June 2009 PEF commissioned an "Expert Panel" to review its *Final Draft-CR3 EPU Licensing Report*. The panel determined that the application would not receive NRC approval as written, requiring the company to expend resources to strengthen the submittal. The company's internal findings [REDACTED]

[REDACTED]. In total, the company contracted with AREVA for [REDACTED] to complete the required work. This is discussed in greater detail in section 3.1.1 and 3.1.2.

**Audit staff recommends that the Commission consider whether the [REDACTED] for the LAR restructuring/rewrite and additional engineering scope by AREVA resulted from inadequate management oversight.**



## 2.0 Levy Nuclear Project

### 2.1 Levy Key Project Developments

Progress Energy Florida shifted its efforts on the Levy Nuclear project from both component construction planning and licensing approval to focus largely on licensing work. Specifically, the company made the decision to shift its construction schedule by a minimum of 60 months and delay all construction initiatives until the issuance of the Combined Operating License (COL) in late 2012 or early 2013. The company anticipates the new in-service dates for Units 1 and 2 to be 2021 and 2022, respectively. PEF states that there are several factors that influenced this decision, including delays in the COL application review process at the NRC, delays with the design certification for Westinghouse's AP1000, current economic conditions, and both federal and state regulatory uncertainties.

#### 2.1.1 Significant Events

##### **EPC Contract**

In April 2009, the company announced that there would be a minimum 20-month shift in the construction schedule for its Levy nuclear project. This resulted from NRC's decision concerning the company's limited work authorization application. As a result of this decision, the milestone dates established in the EPC contract signed in December 2008 were no longer feasible. The company spent most of 2009 and first-quarter 2010 assessing its long-term schedule options. As a result of the company's decision to delay the project, an amendment was added to the contract allowing for a shift in the project milestone dates.

##### Project Schedule Evaluation

On April 30, 2009, the company notified the Consortium that it was enacting the partial suspension clause of the EPC contract for a period of at least 20 months. This partial suspension covered the period originally intended to complete the pre-construction work as outlined in its Limited Work Authorization application. During this same period, PEF started evaluating the impact of this delay on the overall EPC contract schedule. The company requested that the Consortium evaluate the cost and schedule impact of six different schedule-shift scenarios. Three scenarios considered a 24-month shift in Unit 1 combined with an 18, 36, and 60 month shift in Unit 2. The other three considered a 36-month shift in Unit 1 with a similar 18, 36, and 60 month shift in Unit 2.

On August 13, 2009 the Consortium responded to PEF's request with a detailed analysis and assessment of each scenario. The Consortium determined that the two scenarios for a 60-month spread between Unit 1 and Unit 2 were not viable options. The 60-month spread would eliminate the cost and labor benefits of dual construction; essentially creating two separate build projects with separate resource deployments.

When considering the remaining four criteria, the Consortium took a "bookend" approach—analyzing the least-impact scenario and the greatest-impact scenario. With this

approach, the Consortium performed the requested cost and schedule impact analysis on two options: a 24 month shift in Unit 1 with an 18 month shift in Unit two and a 36 month shift in Unit 1 with a 36 month shift in Unit 2 option. PEF agreed with this approach, and the Consortium developed a cost range for the two proposed schedule shift options. The Consortium estimated a cost impact of [REDACTED]. This estimate is based on the original 2007 contract dollars and include only EPC related costs.

The company presented its assessment and the Consortium's analysis results to its Senior Management Committee on October 15, 2009. The committee expressed concern that these shift scenarios may not provide the best long-term option given the current economic conditions within the state. The project team was asked to reevaluate the schedule with additional longer-term suspension options. Specifically, the committee requested that the team evaluate the following options:

- Cancel the Levy Project;
- ◆ Cancel the existing EPC contract with the Consortium while continuing the COL application;
- ◆ Cancel the current EPC Purchase Orders, and suspend the EPC contract while maintaining all beneficial Terms and Conditions while the company continues to work to obtain the COL;
- Continue as planned with the 36/18 schedule shift.<sup>1</sup>

All the while, the company recognized that if cancellation were an option, [REDACTED]

On February 15, 2010, the project team presented the Senior Management Committee its assessment of the three options discussed in October, and recommended that the Levy project move forward under a long-term schedule-shift while preserving the Terms and Conditions of the EPC contract (bullet 3 above). With this shift, the focus of the project would become the COL approval. The Senior Management Committee approved this proposal and the company continued its negotiations with the Consortium to amend the EPC contract.

In March 2010, the company and Consortium agreed to [REDACTED] the company's Board of Directors meeting scheduled for March 17, 2010. At this meeting, the Chairman of Progress Energy presented to the company's Directors a plan to move forward with the long-term schedule shift option and amend the EPC to preserve its

---

<sup>1</sup> PEF Response to Staff Data Request 3.2.

current terms and conditions. On March 26, 2010 the parties signed Amendment 3 of the EPC contract to resolve the impact of the schedule shift.

#### Contract Extension

Amendment 3 to the EPC [REDACTED]

[REDACTED]. Audit staff believes that the company was able to negotiate a favorable amendment with limited fee impact. The company maintained [REDACTED]

[REDACTED]. Significantly, the company maintained the [REDACTED]

PEF also renegotiated the [REDACTED]

[REDACTED]. Specifically, the company can [REDACTED]

The amendment placed the [REDACTED]. Therefore, further negotiations will be required between the company and the Consortium to re-establish the schedule. The company recognizes that this negotiation process will be [REDACTED]. Management states it will initiate the [REDACTED].

The amendment allowed the company to [REDACTED]. Per the EPC contract, [REDACTED] for canceling the contract [REDACTED]. The amendment maintains this [REDACTED] through [REDACTED]. Audit staff notes that while the company states it is committed to moving the project forward, this amendment allows the company [REDACTED].

#### Long-Lead Material Purchase Orders

In addition to negotiating a viable amendment to the EPC contract, the company is also in negotiations to resolve the outstanding Purchase Orders for the project. After the signing of the Letter of Intent in March 2008 and later incorporated into the EPC contract in December 2008, the Consortium initiated Purchase Orders for the necessary long-lead materials and equipment. With the minimum 60-month shift in schedule, the company requested the Consortium to evaluate and propose disposition options for these purchase orders.

The company has [REDACTED] long-lead Purchase Orders valued at [REDACTED]. **Exhibit 1** lists the original purchase orders and their full contract amount. Management is considering several options for the disposition of these orders, including full cancellation of a purchase order,

completing the work as contracted and storing the equipment, storing component in its current state for future completion, or selling completed product/individual components.

[illegible]

Source: PEF Response to Staff Request 5.1

The company authorized [REDACTED] in its 2010 IPP for the disposition of these orders. While PEF estimates the total cost at [REDACTED] to complete this process, this may still be the most cost-effective resolution. The company and the Consortium must negotiate each Purchase Order with each vendor. As of April 2010, the company decided to [REDACTED]

. Also, the company reports that it has been able to defer the [REDACTED] [REDACTED]. Project management is currently in negotiations to resolve the remaining purchase orders. The company anticipates that these efforts will continue through 2010.

## Combined Operating License Application

During 2009, several events impacted the schedule of the company's Combined Operating License application (COLA) review timeline. When the NRC docketed PEF's COLA in 2008, the schedule estimated a COL issuance in late 2011. However, the schedule has shifted to 2012, with the possibility that it may extend into 2013. There are several factors that contributed to this shift, including the company's response time to the more complex and intricate RAI requests, the complexity of the Levy geotechnical analysis, the NRC's review timeline, and the granting of a contested hearing. Additionally, independent of any Levy-specific factors, delays in the revised AP1000 design certification by the NRC may impact the overall COL approval timeline.

#### Schedule

In September 2009, the NRC notified PEF that its review process and the issuance of its Final Safety Evaluation Report (FSER) would take approximately two and a half months longer than originally scheduled. The NRC states that its original review schedule was established with the assumption that the company would respond to RAIs within 30 days of issuance. However, in a September 15, 2009 letter to PEF, the NRC states that:

our schedule assumes that RAI responses will be submitted within 30 days of receipt . . . Although some of [PEF's] responses to geotechnical and structural engineering RAIs have been received within 30 days, many responses have been submitted later than the assumed 30 day time period. The revised safety review schedule in this letter accounts for the actual submittal dates of [PEF's] RAI responses.<sup>2</sup>

The new schedule shifts the FSER issuance from estimated April 2011 to July 2011.

On January 20, 2010 the NRC notified PEF that the review process and issuance of its Final Environmental Impact Statement (FEIS) would be delayed by approximately nine months. The original review schedule projected the FEIS issuance in September 2010, while the new estimate is July 2011. The NRC referenced the complexity evaluating the groundwater modeling, floodplains compensation, and the Least Environmentally Damaging Practicable Alternative (LEDPA) summary. The company states the NRC submitted original and subsequent RAIs on the groundwater and LEDPA summary, requiring additional time for the company to collect, and the NRC to review, the necessary information. The company identified this risk in its Risk Matrix schedule, although it was not ranked as a significant risk.

#### RAI Timelines

The NRC references the company's response time to its RAIs as one reason for extending the COLA review timeline. The company defends its response time, stating that given the complexity of the environmental and geotechnical aspects of the Levy site, the established 30-day turnaround was not achievable. The company states that the Joint Venture Team—the contractors responsible for the COLA submittal—did what was necessary to compile, analyze, and respond to each RAI in a timely manner.

PEF states that it received a total of 731 RAIs through March 2010. Of these, 148 involved environmental issues and 583 were safety-related issues. The company states that of the *environmental* RAIs having specified due dates, the company met the date 99 percent of the time. For the *safety-related* RAIs that included a specified response date, the company states it met the established due date 70 percent of the time.

In addition to the shift in the FEIS and FSER schedule, the Atomic Safety and Licensing Board granted two environmental contentions to the application. This decision will require a separate evidentiary hearing to be held in addition to the mandatory hearing required by the COL approval process. Because the contentions involve environmental and safety issues, the FEIS

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<sup>2</sup> PEF Response to Staff Data Request 4.10A, Bates 000012

and the FSER must be issued prior to the start of the contested hearing. The contested hearing and the mandatory hearing can occur in parallel, but this is not guaranteed. The combination of delays in the FEIS timeline and the contested hearing has moved the COL issuance to late 2012.

Along with the Levy-specific COLA delays, Westinghouse has experienced delays in its design certification of the AP1000. In September 2009, the NRC notified Westinghouse that it would require more information concerning its reactor shield design. This issue, along with the remaining design certification revision 16 and 17 issues, has extended the NRC's approval of the final AP1000 certification. The current schedule anticipates certification to occur prior to the Levy COL timeline, however, if additional delays occur in the design certification, the Levy COL issuance could be delayed past the late 2012 timeline.

### **Levy Transmission**

In conjunction with the overall project schedule shift, the company has suspended its efforts to design and develop the new Levy transmission corridors. Once the company implemented the long-term schedule shift, the transmission project team suspended its engineering and design work. The company will continue this work once a new project timeline is developed.

The company completed two Levy transmission projects during 2009. The project team determined that it was cost-effective to complete this work as planned, rather than delaying it to a future date. One project involved offsetting the cost to upgrade a section of poles being installed along the planned Levy transmission corridor. While these poles were being installed for distribution lines, the company used poles rated to support both distribution and transmission. This eliminated the need to install or replace poles at a future date.

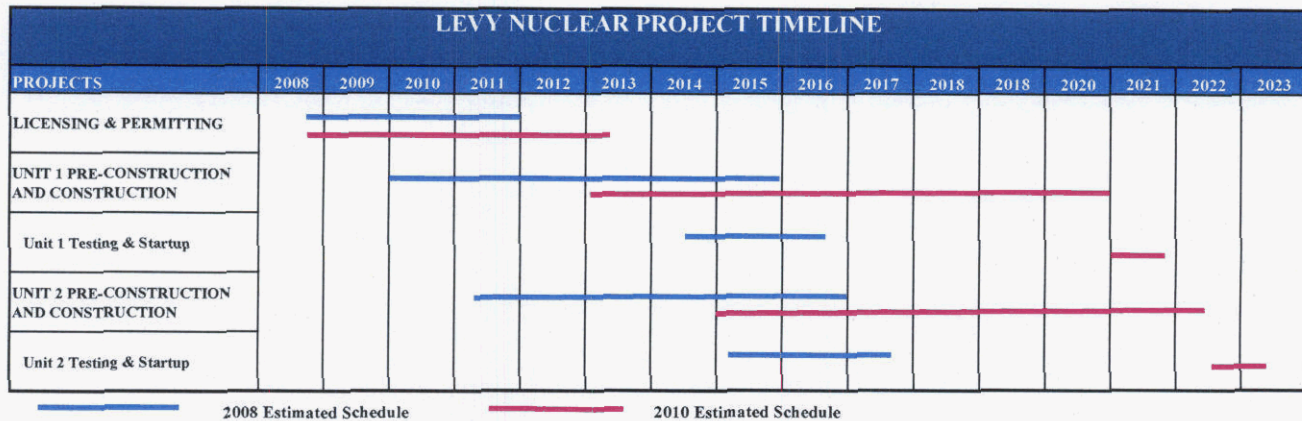
The second project was the installation of three switches at the Crystal River Energy Complex's (CREC) switchyard. The Levy plant will connect to the company's existing transmission facilities at this site. To complete this connection, three new switches were required at the facility. During 2009, the company had a unique opportunity to complete this work with minimal impact to the operation of the units at the CREC. Both CREC Unit 3 and Unit 5 were offline concurrently during the fall of 2009, allowing this work to be performed with minimal interruption to generation.

### **2.1.2 Impact on Schedule and Cost**

PEF's decision to focus its efforts solely on regulatory approval will impact the overall project timeline and total cost. As of the 2009 NCRC hearing, the company anticipated at least a 20 month delay to its original in-service date of 2016. However, the company recognizes that the schedule shift will be far greater than the original estimate. PEF states that there are delays in the AP1000 design certification. There have been additional delays in the NRC COLA application process and the current depressed national and state economic conditions have not significantly improved. These factors influenced the company's decision to shift the project schedule into the early 2020s.

### Schedule

The company's current timeline for a 2021 Unit 1 in-service date and 2022 for Unit 2 represents a minimum 60-month shift from its original 2016 and 2017 timeline. PEF notes that the 2021 timeline is only an estimate, as specific construction milestone dates will not be negotiated with the Consortium until the COLA is further along in the review process. **Exhibit 2** details the 2008 schedule established in the EPC and the company's most recent target timeline.

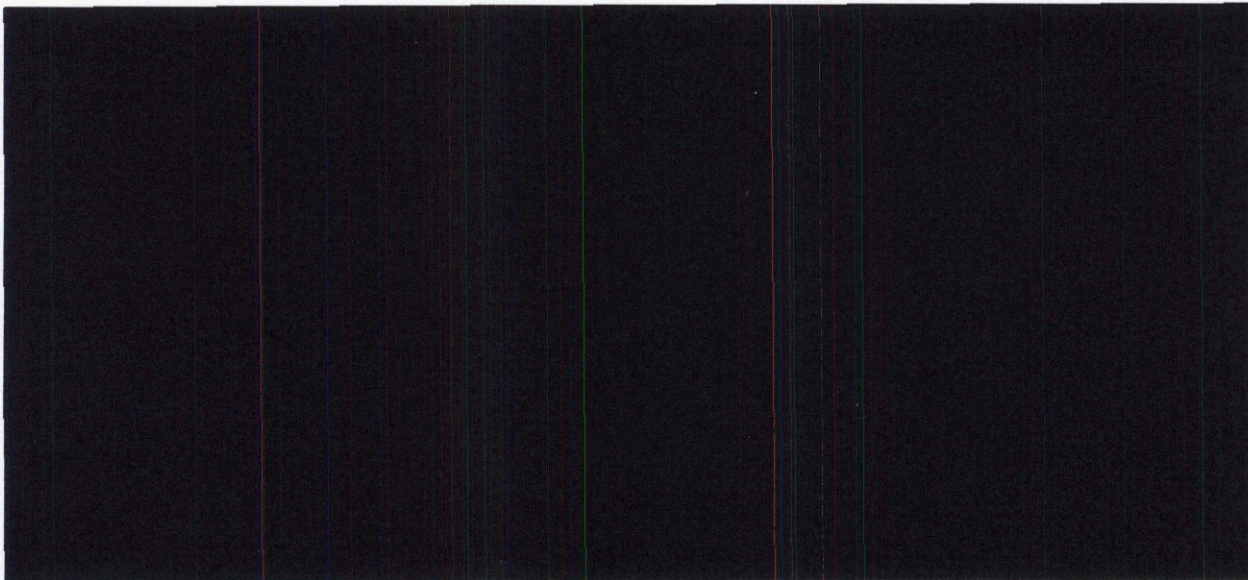


**EXHIBIT 2**

Source: PEF Response to Staff Data Request 3.1-282

### Cost

PEF estimates that there will be an increase in project cost as a result of the shift in schedule. In 2008, the company estimated the total project cost, excluding AFUDC, at [REDACTED]. The 2010 estimate, using the 2021/2022 in-service date as its base, projects the cost at [REDACTED]. This represents an approximate [REDACTED]. **Exhibit 3** tracks the company's estimated total project costs for the years 2008-2010.



**EXHIBIT 3**

Source: PEF IPP—2008 & 2010

The company revised its *Integrated Project Plan* (IPP) in April 2010 and identified areas where increases are expected to occur. These include increases for both the transmission and generation projects. **Exhibit 4** details the areas of increase and estimated cost impact. As the exhibit shows, [REDACTED], projected at [REDACTED], comprises the majority of the increase.

| PEF Estimated Levy Project Cost<br>Revised April 2010<br>(in millions)   |                                    |
|--|------------------------------------|
| Area of Increase   | Estimated Increase in Project Cost |
| EPC Incremental Schedule Shift (Purchase Order disposition and incremental cost changes)   | [REDACTED]                         |
| Design Change Proposals  | [REDACTED]                         |
| Escalation Increases (Schedule shift and others)   | [REDACTED]                         |
| Contingency: Re-assessment of Risk   | [REDACTED]                         |
| Other Costs: PGN labor, Spare Parts, Insurance, Taxes, Temporary facilities, COLA, Construction Power, Emergency Preparedness, Environmental Protection, Other | [REDACTED]                         |
| <b>Total</b>   | [REDACTED]                         |

**EXHIBIT 4**

Source: PEF Response to Staff Data Request 4.3

In the near-term, PEF notes that the schedule shift will delay the major construction costs, which will defer the cost impact on its rate base during this period of slow economic growth. The April 2010 IPP authorized approximately [REDACTED] in spending over the next three years for the Levy project. Specifically in 2010, the company anticipates expenditures of [REDACTED] for the disposition of the long-lead items outlined in the EPC contract. For 2011 and 2012, the company authorized [REDACTED], respectively. **Exhibit 5** details the breakdown of anticipated Levy costs for 2010 through 2012.

| PEF Three-Year Estimated Expenditures for the Levy Project<br>2010 -2012<br>(in millions) |            |            |            |                              |
|---|------------|------------|------------|------------------------------|
| Expenditures  | 2010       | 2011       | 2012       | Three-Year Total Projections |
| EPC Payments  | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED]                   |
| LLM Payments & Westinghouse Support   | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED]                   |
| LLM PO Disposition (one-time cost)  | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED]                   |
| Transmission  | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED]                   |
| COLA  | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED]                   |
| Wetland Mitigation  | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED]                   |
| Other Cost  | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED]                   |
| <b>Total</b>  | [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED]                   |

**EXHIBIT 5**

Source: PEF Response to Staff Data Request 4.3

As noted, PEF evaluated the cost of canceling the project versus the long-term schedule shift. The company states that the estimated cost to cancel the project was [REDACTED], while the anticipated cost to extend the schedule and renegotiate the contract was [REDACTED].<sup>3</sup> If the company remains committed to completing the project, the cost differential is necessary.

### **Project Organization**

As a result of the schedule shift and the deferral of the construction schedule, the company is restructuring its nuclear organization in second quarter 2010. The new organization will incorporate the Nuclear Construction group, Non-nuclear Construction, and the Nuclear Operational Readiness group. The new organization will be titled New Generation Programs and Projects. The group will be managed by the current Vice President of Nuclear Construction. The new organization will be responsible for all major construction projects within Progress Energy. It will allocate resources to both nuclear and non-nuclear generation projects through the company.

In 2009, the company implemented an Operational Readiness group to plan and prepare for the operation of the Levy Nuclear facility. PEF management states that this organization was responsible for developing a program to hire and train the specialized work-force necessary to operate the plant. Also, this team is involved in the oversight of the required on-site training facility. PEF believed that given the complexity of its work scope, it was necessary to initiate this organization at the onset of project implementation.

The company states that when the Operational Readiness organization was formed in 2009, PEF believed that the schedule shift would be between 20 and 36 months. Management believed that with this medium-term shift in the overall project schedule, the Operational Readiness team was still necessary and timely. When the company made the decision to enact a long-term schedule shift, the role of the Operational Readiness group was seen as less time critical. As a result, the team will be incorporated into the newly formed New Generation Programs and Projects division, while the Vice President of Operational Readiness plans on retiring in 2010.

Audit staff recognizes the important role the Operational Readiness group will have in the successful implementation of the future Levy Nuclear plant. It will take time for the company to develop the necessary training regiment and recruit a qualified operating staff for the new plant. However, audit staff has concerns about the timing and resources placed on this group during 2009, given the schedule flux and the company's consideration to cancel the project.

Audit staff recognizes that 2009 represented a shift in the company's commitment to the Levy project. In prior years, the company placed significant resources and management support into ensuring a swift development and construction timeline. However, in 2009 the company was wavering in its commitment to the project. Cancellation was considered by senior management, and it appears that had the company not been able to negotiate the favorable outcome with the Consortium, senior management would not have moved forward with the current project. Audit staff also notes that the EPC Amendment three [REDACTED]

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<sup>3</sup> April 30, 2010 Testimony of Mr. John Elnitsky, Docket 100009-EI.

[REDACTED]. During this period, the company [REDACTED]. Audit staff believes the company will continue to monitor and evaluate the factors that influenced its decision to implement a long-term schedule shift during the next few years, and if necessary, may reconsider the viability of the current project.

## 2.2 Levy Project Controls and Oversight

### 2.2.1 Project Controls, Risk and Management Oversight Changes

PEF requires that its management team develop and maintain an *Integrated Project Plan* (IPP) for each major project implemented by the company. This plan establishes the financial requirements necessary to complete the project along with the project scope, deliverables, and risks associated with the project. Senior management uses this document to assess the overall feasibility of the project and to track the overall financial commitment for the project.

#### Integrated Project Plan

In 2006, PEF's procedures regarding major capital projects (those in excess of \$5 million) required that the new plant 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. The initial March 2006 BAP presented the option of pursuing COLAs for both the Levy project and separate units to serve Progress Energy-Carolina. 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 2016-2017. A second revision to the BAP was approved in April 2008 to approve the Letter of Intent with the Consortium. The Letter of Intent initiated the purchase order activity for the long lead materials.

During 2008, PEF migrated major projects towards its new *Integrated Project Plan* 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.<sup>4</sup>

The original Levy Nuclear Project IPP was initiated on September 5, 2008, updated on December 18, 2009 (Rev. 1), and further updated on April 28, 2010 (Rev. 2). The changes made in December 2009 (Rev. 1) allow for continued funding during the time that PEF and the Consortium were renegotiating an amendment to the EPC contract. This IPP revision authorized continued spending on the Levy project [REDACTED].

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<sup>4</sup> FPSC's August 2008 *Review of PEF's Project Management Internal Controls for Nuclear Plant Upate and Construction Projects*, pages 29-30

The changes made in April, 2010 (Rev. 2) reflect management's continued approval of the project and allowed for 2010 annual spending for the Levy partial suspension and provides updates related to the decision to continue partial suspension.<sup>5</sup> The project team recommended a [REDACTED]

[REDACTED]. The 3-year total includes [REDACTED], which may arise as part of long-lead material purchase order disposition with Westinghouse. The Project Team will update the Senior Management Committee mid-2010 with LLM PO disposition costs for approval. The Project Team recommended annual updates on work progress and authorization for subsequent year funding during the partial suspension.

Staff recognizes that the company followed its process with regards to IPP revision. The company adequately updated the IPP to reflect changes in the Levy Nuclear Project scope and cost. Staff verified that senior management approved the revisions to the IPP.

### **Project Management Policies and Procedures**

PEF has procedures in place that direct the oversight and control of the Levy Nuclear Project. The company created or updated these procedures as the project progressed and developed over time. Additionally, the company developed (and is continuing to refine) standard procedures for project management, through its *Project Management Center of Excellence*. PEF recently revised forty-seven procedures for the Levy project. A list of the procedures and their revision dates are shown in **APPENDIX A**. These procedures cover areas including the development of procedures, the corrective action for adverse conditions, engineering, procurement and material controls, nuclear oversight, records and document control, organization and administration, industrial safety, nuclear generation group manuals, nuclear contract management, and non-nuclear contract management.<sup>6</sup>

PEF created thirty-one new procedures in 2009 for the Levy project. A list of the new procedures is shown in **APPENDIX B**. These new procedures cover the areas of interface agreements, nuclear plant development, project management, engineering, project assurance, program governance, and real estate governance.

The company is currently developing additional procedures that will provide oversight for the Levy project. These procedures are part of the further implementation of its *Project Management Center of Excellence*. Future planned procedures for the Levy project are shown in **EXHIBIT 6**.

The company does not plan to develop further EPC procedures at this time. It will resume development of procedures once the company moves forward with the project and specific events trigger the need. The company reviews policies, procedures, and controls; and issues new procedures when needed based on changing business conditions, organizational changes, project work schedules, etc.<sup>7</sup>

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<sup>5</sup> PEF Response to Staff Data Request 4.3S1 BATES 000002

<sup>6</sup> PEF Response to Staff Data Request 1.12, BATES 0000028 - 0000030

<sup>7</sup> Ibid.

| PEF Planned Project Management Procedures<br>for the Levy Nuclear Project      |  |                  |                             |
|--|--|------------------|-----------------------------|
| Procedure Title  |  | Procedure Number | Procedure Number<br>/(Date) |
| Project Integration Management   |  | PJM-SUBS-00002   | Rev 0 (TBD)                 |
| Project Management Responsibilities for All Projects<br>with ITT Related Scope |  | PJM-SUBS-00018   | Rev 0 (TBD)                 |
| Integrated Logistics Support Planning  |  | PJM-SUBS-00020   | Rev 0 (TBD)                 |
| Achieving Excellence in Program Management                                     |  | PJM-SUBS-00030   | Rev 0 (TBD)                 |

**EXHIBIT 6**

*Source: PEF Response to Data Request 1.12*

Staff reviewed the new and revised policies and procedures. These appear to be in compliance with the company's standards for development of policies and procedures. Staff recognizes that the company will develop policies and procedures in the future, as needed to implement the terms of the EPC contract.

**Oversight and Management Policies and Procedures for Contractors**

With the schedule shift, there is limited field activity on the generation part of the Levy project. The Company meets regularly with the EPC Consortium, and there are currently, at minimum, bi-weekly phone calls with the Joint Venture Team (Sargent & Lundy, Worley Parsons, and CH2MHILL) to discuss work scopes supporting COLA and SCA projects.

To facilitate contractor oversight, large contracted scopes such as the COLA and SCA are divided into individual tasks which may be more closely managed and monitored by the project team. Monthly reports including production status and earned value are provided for each task. Earned value reports are generated and submitted monthly. At a minimum, the report will indicate the activity description, original budget quantities, original budgeted man-hours, current budgeted man-hours, planned man-hours, earned man-hours and percent complete for the entire scope of the contractor's work.<sup>8</sup>

Each quarter, the Joint Venture Team convenes with the Nuclear Plant Development management team in Raleigh for a face-to-face management review meeting. In addition to topics discussed each week, the monthly reports also provide information relative to scope, budget, invoicing, schedule performance, and cash flow projections. Audit staff reviewed these reports for the review period.

In addition, Progress Energy has a technical lead providing oversight and coordination with contractors required to be onsite for COLA field work or project planning activities. When contractor activities warrant, specific work plans describing contractor scope and Progress Energy oversight and engagement in areas such as Quality Assurance are developed. Examples of this include safety related field work such as the Grout Test and Offset Boring Program that

<sup>8</sup> PEF Response to Staff Data Request 1.12B BATES 000331.

was completed in 2009.<sup>9</sup> The Grout Testing and Offset Boring Program were necessary to respond to NRC RAIs, and consisted of geotechnical drilling, sampling and testing.<sup>10</sup>

Work on the Levy Transmission projects is also monitored regularly. The Levy Transmission Team communicates with contractors and monitors their work on a regular basis to ensure that the work is progressing as planned and that any issues are addressed timely. These communications generally include periodic meetings, conference calls, status updates, etc.<sup>11</sup>

The company's new or revised oversight and management procedures for contractors working on the Levy project are shown in **EXHIBIT 7**. Staff reviewed management reports for the period to verify these procedures were implemented in accordance with the company standards.

| New or Revised Contractor Oversight and Management Procedures<br>for the PEF Levy Nuclear Project |                  |                                  |
|---|------------------|----------------------------------|
| Procedure Title   | Procedure Number | Procedure Revision Number (Date) |
| Contract Management Compliance  | CNT-SUBS-00007   | Rev 4 (Nov-2009)                 |
| Contract Management Compliance Program Details  | CNT-SUBS-00008   | Rev 1 (Nov-2008)                 |

**EXHIBIT 7**

Source: PEF Response to Data Request 1.33

#### Controls Implemented in 2009 or Planned for 2010

The Progress Energy *Project Management Center of Excellence* (PMCoE) was chartered in May 2008 to establish enterprise wide project management standards. The roll out of each standard was accomplished through the creation of 15 procedures that became effective at various times throughout 2009. These procedures are shown in **APPENDIX C**

Along with each procedure, the PMCoE provided class room training for project managers (PM), webinars for a broader audience of non-PM project personnel, and tools, templates, reference materials and examples through the PMCoE Project Management intranet site. In addition, the PMCoE also engaged individual project teams through consultation on activities related to planning, execution and closing the project. In 2010, PMCoE will finalize a procedure in Project Integration Management and plans to establish standards for the following:

- Integrated Logistic Support Planning
- Earned Value Management System Implementation<sup>12</sup>

<sup>9</sup> PEF Response to Staff Data Request 1.1, BATES 000003. The Grout Test was performed to develop the optimum grout mix design, to determine grout pressure and grout hole configuration; confirm acceptable water cutoff to support dewatering of the excavation; and, confirm grouted limestone remains consistent with foundation design parameters.

<sup>10</sup> PEF Response to Staff Data Request 1.25, BATES 000327 - 000354

<sup>11</sup> PEF Response to Staff Data Request 1.33, BATES 0000060

<sup>12</sup> PEF Response to Staff Data Request 1.19, BATES 0000040 – 0000041.

| Top-Tier Risks Identified—Levy Integrated Project Plan<br>April 2010                                   |  |
|--|--|
| Risk   | Mitigation Actions   |
| Transmission and wetland mitigation land acquisition uncertainty                                       | <ol style="list-style-type: none"> <li>1. Ensure close engagement with environmental agencies to determine diverse mitigation strategies for wetlands.</li> <li>2. Develop strategic land owner compensation approach and consistent negotiation approach.</li> <li>3. Conduct community outreach planning, land procurement strategy and permitting plan.</li> <li>4. Work with local officials to facilitate timely administrative hearings.</li> </ol>  |
| Complex RAIs could result in FEIS, FSER and COL schedule delays  | <ol style="list-style-type: none"> <li>1. Establish and track interim milestones for completion of each RAI response.</li> <li>2. Discuss with NRC promptly any RAI response which is anticipated to exceed the expected response time.</li> <li>3. Review RAI response development status at least weekly with assigned personnel.</li> <li>4. For complex RAIs, such as the recently received RAIs related to seismic/structural, develop a response plan and review with NRC to ensure information needs will be met.</li> </ol>  |
| Material and labor are subject to cost escalation  | <ol style="list-style-type: none"> <li>1. The Company entered into an EPC contract in which all the long-lead material is either fixed, subject to firm escalation.</li> <li>2. An independent third party provided a long-range forecast for the primary index included for other contracted items subject to indexed escalation.</li> <li>3. The estimate allows for adequate contingency for moderate changes in escalation.</li> <li>4. Additional terms in the EPC contract incorporate incentive/penalty mechanisms for minimizing craft labor rate volatility risk.</li> <li>5. Overall choice of passive reactor design (versus an active design) reduces risk associated with overall market escalation due to simpler design with fewer components.</li> </ol> |
| If contested and mandatory hearings are not completed as planned, COL approval schedule is impacted    | <ol style="list-style-type: none"> <li>1. Complete and deploy effective communication plan for key milestone events.</li> <li>2. Develop focused outreach, communication with key stakeholders.</li> <li>3. Ensure communications are transparent and open with consistent messaging.</li> <li>4. Engage subject matter experts with legal representatives in preparing for contested and mandatory hearings.</li> <li>5. Work with ASLB, NRC staff and intervenors to establish efficient schedule for conduct of hearings.</li> </ol>  |
| If Westinghouse fails to obtain AP1000 design certification, the overall plant schedule is jeopardized | <ol style="list-style-type: none"> <li>1. The Company has allowed adequate contingency in the schedule by initiating partial suspension with the EPC.</li> <li>2. Assign appropriate subject matter experts and collaborate with Nustart and AP1000 utilities to ensure appropriate action is taken.</li> <li>3. Actively support the AP1000 Licensing Finalization team and interface with NRC to develop efficient sequence to complete DCD and Reference COLA review and approval.</li> </ol>   |
| The LEDPA analysis could impact the FEIS and 404 permits   | <ol style="list-style-type: none"> <li>1. Develop response that incorporates USACE comments and clearly shows that Levy is the least environmentally damaging site.</li> <li>2. Meet with USACE prior to submitting the revised LEDPA analysis to ensure that the analysis/responses to RAIs are comprehensive and address the USACE concerns.</li> </ol>  |
| The Long Lead Material (LLM) POs could adversely affect the project cost estimate and schedule         | <ol style="list-style-type: none"> <li>1. Obtain necessary PO information from the Consortium and vendors required to support decision analysis.</li> <li>2. Utilize Quantitative and Qualitative analysis methodology to ensure the proper disposition of all LLM.</li> <li>3. Perform independent third party review of decision methodology and Progress Energy decisions to ensure reasonable and prudent disposition of all LLM.</li> </ol>   |

## EXHIBIT 8

Source: PEF Response to Data Request 4.3SI

### **Risk Assessment and Mitigation**

During August 2009 through November 2009, NPD conducted risk review meetings to evaluate all applicable project risks. Based on the schedule shift, previously identified risks were re-evaluated to determine risk ranking and actions. Progress Energy maintains a Risk Management Plan for both the Levy Transmission Program and the Crystal River Switchyard project.<sup>13</sup> With the April 2010 revision of the IPP, management identified seven top-tier project risks and their mitigation actions. These are shown in **EXHIBIT 8**.

#### **Feasibility**

A feasibility assessment is also included in the IPP. One aspect of the feasibility assessment is a life-cycle net present worth assessment (also known as cumulative present value of revenue requirements, or CPVRR) of the project. In anticipation of a possible FPSC requirement in the 2010 NCRC proceeding, PEF updated the CPVRR assessment based on the company's current forecasts for submission in this year's filing. PEF states that the results of the updated CPVRR assessment indicate that the plan is favorable in more cases than not. This is one of many indicators that have been reviewed in considering the ongoing feasibility of the project. PEF believes that based on the CPVRR assessment and other qualitative factors set forth in their April 30, 2010 NCRC filing, the Levy Nuclear Project continues to be a viable generation option with the revised estimates.<sup>14</sup>

#### **Transmission Risk**

The Land Acquisition Project was reevaluated, and with increased time to procure the necessary land associated with the transmission routes, the company deemed it prudent to move to a self-managed land acquisition approach versus utilizing the previously planned "turn-key" or Acquisition Program Manager Approach. The near term focus will be to acquire strategic land rights for plant and transmission needs.

Work Authorizations related to the Transmission Owner's Engineering firm, Patrick Energy Services, were terminated as of December 31, 2009. In light of the limited near-term work scope, transmission design packages currently underway were halted. The Levy Transmission Engineering work was packaged and archived for future use when Levy Transmission Engineering design resumes.

The Work Authorization for Commonwealth Associates Inc. was also terminated as of December 31, 2009. Commonwealth provided the final layout of the Crystal River Energy Complex switchyard upgrades required for the addition of the two Levy Nuclear plants. The Central Florida South Substation Project, which was originally planned to have costs shared between the Transmission Operations and Planning Department (TOPD), was suspended by the Levy Project. Project costs to-date were transferred to TOPD in December 2009.<sup>15</sup>

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<sup>13</sup> PEF Response to Staff Data Request 1.7, BATES 0000015

<sup>14</sup> PEF Response to Staff Data Request 4.3, BATES 000015 - 000023

<sup>15</sup> PEF Response to Staff Data Request 1.8, BATES 0000016 - 0000017.

### **Changes to Management Oversight**

Nuclear Plant Development (NPD) made changes to its Organization Plan and Support Functions for the Levy project on December 1, 2009, and further changes are planned for 2010.<sup>16</sup> Many positions on their organization charts were suspended as a result of the Levy schedule shift. During the continued period of limited work scope on the Levy project, the company does not anticipate any increase to staffing during 2010. The company continues to evaluate the appropriate schedule for filling vacancies. Certain individuals who were providing support for the Levy baseload transmission work will be reassigned for a period of approximately 12-18 months during the limited work scope period. Other positions within NPD have been reassigned as well.<sup>17</sup>

Senior level managerial changes have occurred since May 2009. The Vice-President of Generation and Transmission Construction was named Vice-President of Nuclear Plant Development, and as of August 2009, reports directly to the Executive Vice-President of the Corporate Development Group. The former President of Progress Energy Florida was named the Executive Vice-President of the newly-formed Corporate Development Group for Progress Energy in August 2009. In this capacity, the Executive Vice-President of the Corporate Development Group continues to have primary oversight for the Levy Nuclear Project. Following this, a new President and CEO of Progress Energy Florida was selected from within the company.<sup>18</sup>

### **2.2.2 Internal Audits and Quality Assessments**

Multiple groups have internal audit and quality assessment responsibility within Progress Energy Florida's organization. The company maintains an Audit Services Department that provides internal corporate audits. Additionally, the company has a Nuclear Oversight (NOS) Department charged with inspecting and monitoring the nuclear safety work performed at the within the company. Both groups performed audits and quality assurance reviews involving the Levy project during 2009.

#### **Audit Services Department**

Progress Energy's Audit Services Department (ASD) maintains an annual construction audit strategy that solicits input from management, ranks potential audits based on risks, and establishes an annual audit plan. In 2009, ASD used the following risk-based focus areas to rank the scope of its audits:

- ◆ Business & Regulatory Environment
- ◆ Scope & Change Control
- ◆ Schedule
- ◆ Cost Management
- ◆ Communications & Reporting
- ◆ Procurement & Contracts
- ◆ Accounting & Financial Reporting

<sup>16</sup> PEF Response to Staff Data Request 1.13, BATES 13000001 – 13000008.

<sup>17</sup> PEF Response to Staff Data Request 1.16, BATES 0000035.

<sup>18</sup> PEF Response to Staff Data Request 1.15, BATES 0000034.

The ASD completed three internal audits for the Levy project in 2009. These internal audits are shown in **EXHIBIT 9**, and are discussed in more detail below.

| PEF Levy Nuclear Project<br>Internal Audits Completed During 2009 |  |                |                  |
|---|--|----------------|------------------|
| Audit Title   |  | Project Number | Report Date      |
| Engineering, Procurement & Construction (EPC) Contract            |  | 20013334 A913  | August 3, 2009   |
| Florida Nuclear Plant Cost Recovery Rule Compliance               |  | 20013334 A916  | May 26, 2009     |
| Levy Baseload Transmission Program                                |  | 20013334 A919  | December 9, 2009 |

**EXHIBIT 9**

Source: PEF Response to Data Request 1.36

**Engineering, Procurement & Construction (EPC) Contract Audit**

The scope of the Engineering, Procurement & Construction (EPC) Contract internal audit included the Levy EPC agreement, the Burns and Roe report, and PricewaterhouseCoopers (PWC) report. The objective of the audit was to review the key provisions of the EPC contract and to assess the sufficiency of internal policies and procedures that have been developed to support the administration of the EPC. The Audit Services Department also reviewed the Burns and Roe report and the PWC report as part of this audit.

The key focus areas of this internal audit consisted of:

- ◆ Evaluation of the adequacy of the procedures developed by Nuclear Plant Development (NPD) to support the EPC contract provisions including identification, assessment, and assignment of trigger points and key contract milestones.
- ◆ Review of the administration of the invoices.
- ◆ Evaluation of the status of the NPD actions in response to the Burns and Roe report and the PWC report.

The Audit Services Department concluded that [REDACTED]. Overall, ASD thought the processes in place to support the administration of the [REDACTED]. Observations and recommendations were presented to management by ASD with regards to areas needing improvement. These areas [REDACTED]. The first recommendation was to [REDACTED] was to [REDACTED]. The second recommendation [REDACTED].

Management developed an Action Plan for each improvement area and assigned responsibility to complete by assigned completion dates. ASD made sure that all items were resolved and set the follow-up status for each to "closed".<sup>19</sup>

#### Florida Nuclear Plant Cost Recovery Rule Compliance Audit

The objective and scope of the Florida Nuclear Plant Cost Recovery Rule Compliance internal audit was to review compliance with 25-6.0423, FAC for filings made in 2009 related to the CR3 Uprate Project and Levy Nuclear Plant.

The key focus areas of this internal audit consisted of:

- ◆ Reviewing planned regulatory filing reports for completeness and accuracy and adequacy of internal reviews.
- ◆ Testing a sample of actual costs included in the filings to ensure that supporting documentation is sufficient.
- ◆ Reviewing the process used to estimate projected costs for reasonableness.

The Audit Services Department concluded that overall compliance with the Florida Nuclear Plant Cost Recovery Rule [REDACTED]. ASD tested a sample of invoices and supporting documentation which revealed that charges recorded to the project [REDACTED]. Overall, they found that the related controls [REDACTED].<sup>20</sup>

#### Levy Baseload Transmission Program Audit

The scope of the Levy Baseload Transmission Program audit included the areas of Self-Managed Land Acquisition Program, Central Florida South Substation Project, and Crystal River Energy Complex (CREC) Substation Expansion Phase I. The objective of the audit was to assess the project's risk identification, key internal processes and procedures, and related controls to mitigate the various forms of project risk. The key focus areas of this internal audit consisted of:

- ◆ Evaluation of project management efforts.
- ◆ Assessment of controls and processes for key business and regulatory environment risks.
- ◆ Evaluation of key controls, processes, procedures, organizational structures, and specific plans relevant to the scope areas above.

The Audit Services Department concluded that the Levy Baseload Transmission Program [REDACTED]. The audit identified four observations in its report. These observations and ASD's recommendations were presented to management.

<sup>19</sup> PEF Response to Staff Data Request 1.36, BATES 000007 – 000011.

<sup>20</sup> PEF Response to Staff Data Request 1.36, BATES 000013.

The first recommendation was to update [REDACTED]

The second recommendation [REDACTED]

The third recommendation [REDACTED]

The final recommendation [REDACTED]

Action Plans were developed and assignments were made to personnel with responsibility to complete by assigned completion dates. ASD verified that all items were resolved and set the follow-up status for each to "closed".<sup>21</sup>

#### Planned 2010 Internal Audits

The Audit Services Department (ASD) has scheduled three audits for 2010. The company has not finalized the timeline for performing these audits. **EXHIBIT 10** lists the 2010 planned audits.

| PEF Levy Nuclear Project<br>Internal Audits Planned for 2010 |                |             |
|--|----------------|-------------|
| Audit Title  | Project Number | Report Date |
| Florida Plant Cost Recovery                                  | 20010800 A1016 | TBD         |
| Levy Nuclear Plant (including Harris COLA)                   | 20010800 A1009 | TBD         |
| Levy Nuclear Plant Transmission                              | 20010800 A1010 | TBD         |

#### **EXHIBIT 10**

*Source: PEF Response to Data Request 1.36*

#### Quality Assurance Reviews and Audits

The Levy project's Nuclear Oversight (NOS) Department is charged with inspecting and monitoring the nuclear safety work performed at the Levy Nuclear Plant. NOS staff is assigned

<sup>21</sup> PEF Response to Staff Data Request 1.36, BATES 000015 – 000021.

to the plant and specialize in nuclear-related issues. The work of the NOS staff is guided by the NOS-NGGC-0100 *Nuclear Oversight Assessment Process* procedure. This document establishes the assessment process and provides direction on planning, preparation, performance, reporting and follow-up for Nuclear Oversight (NOS) Department performance-based assessments as described in the respective plant's Quality Assurance Program Description.

The quality assurance reviews and audits are accomplished through performance-based, real-time observations, technical reviews, and interviews with personnel. Findings, when identified, are based on best practices or minimum acceptable standards or requirements. Identification of a finding does not indicate unsatisfactory performance unless specifically stated.<sup>22</sup>

The Nuclear Oversight (NOS) Department performed eight audits in 2009. The quality assurance reviews and audits completed in 2009 are shown in **EXHIBIT 11**. FPSC Audit staff reviewed these audits and does not consider the findings to be of particular concern. In each case, the findings were satisfactorily resolved according to PEF.

The Nuclear Oversight (NOS) Department has planned four quality assurance assessments and audits for 2010. These assessments and audits include both internal PEF assessments and cooperative audits with the Nuclear Procurement Issues Committee—NUPIC—organization. The quality assurance assessments planned for 2010 are shown in **EXHIBIT 12**.

| PEF Levy Quality Assurance Assessments<br>Completed During 2009                |                       |                    |
|--|-----------------------|--------------------|
| Description  | Report Number         | Completion Date    |
| LNP Grout Test Post Stop Work Restart QA Surveillance Activities               | NPD-QA-2009-001       | February 11, 2009  |
| PGN Supplier Audit of CH2MHILL   | QAA/0274-09-01        | April 2, 2009      |
| QA Surveillance of Field Activities Associated with LNP Grout Test Program     | NPD-QA-2009-002       | April 9, 2009      |
| NUPIC Supplier Audit of Shaw, Stone & Webster                                  | 2009-0012 NUPIC-20365 | May 7, 2009        |
| NUPIC Supplier Audit of Westinghouse Electric Company                          | TVA 2009V-20          | July 31, 2009      |
| Surveillance Number 1 Observations of LNP Offset Boring Program                | NOS-2009-032          | September 3, 2009  |
| Surveillance Number 2 Observations of LNP Offset Boring Program                | NOS-2009-033          | September 24, 2009 |
| Internal NOS Assessment of Nuclear Plant Development and Operational Readiness | N-NP-09-01            | October 2, 2009    |

**EXHIBIT 11**

Source: PEF Response to Staff Data Request 1.37

<sup>22</sup> PEF Response to Staff Data Request 1.12A, BATES 001155 – 001196.

| PEF Levy Quality Assurance Audits<br>Planned for 2010  |               |                              |
|--|---------------|------------------------------|
| Description  | Report Number | Completion Date              |
| Limited Scope Utility/NuStart Audit of Westinghouse Electric Company focusing on Criterion III and XVI | TBD           | March 2010                   |
| NUPIC Supplier Audit of Westinghouse Electric Company AP1000 Projects                                  | TBD           | 3 <sup>rd</sup> Quarter 2010 |
| NUPIC/Utility Audit of Shaw Stone and Webster – AP1000 Project Office – Charlotte                      | TBD           | TBD                          |
| Internal NOS Assessment of Nuclear Plant Development and Operational Readiness                         | N-NP-10-01    | September 2010               |

**EXHIBIT 12**

*Source: PEF Response to Staff Data Request 1.37*

## 2.3 Levy Contract Oversight and Management

### 2.3.1 Changes to Contracts and Contract Management

PEF modified twenty-eight procedures that deal with Contractor Selection and Management. These procedures cover the areas of contractor compliance, procurement and payment approvals, procurement and material controls, nuclear generation group support, records and document controls, and contractor safety.<sup>23</sup> A list of the Contractor Selection and Management Policies and Procedures that have been revised, and are applicable to the Levy project are shown in **APPENDIX D**.

#### Levy Nuclear Plant Generation Contracts

Contracts for the Levy project may be separated into those for Nuclear Plant Generation and those for Levy Transmission. PEF provided all RFPs issued and bid evaluations (both financial and technical) supporting Levy project contracts in excess of a \$100,000 bid since last provided in 2009. PEF provided the Nuclear Plant Generation contracts or contract addenda for materials and/or services valued greater than \$100,000 that have been updated since the last review. The majority of these contracts involve COL-related work. A list of these contracts is found in **EXHIBIT 13**.

<sup>23</sup> PEF Response to Staff Data Request 1.32, BATES 0000057 – 0000059.

## PEF Levy Nuclear Plant Generation Contract Updates in 2009

\*\* Contract 420400 actual dollars to date based on Levy RAI request.

\*\*\* Contract 293651 Amendment 2 and Contract 435529 were initiated

**EXHIBIT 13** Source: Data Request 1.2

Source: Data Request 1.24

## Planned for 2010

PEF states that at this time no new contract activities are planned for 2010, however, the following carryover contract activities are planned to continue work into next year:<sup>24</sup>

<sup>24</sup> PEF Response to Staff Data Request 1.24, BATES 000001 – 000002.

- ◆ [REDACTED]
- ◆ [REDACTED]
- ◆ [REDACTED]
- ◆ [REDACTED]

[REDACTED]

#### **Levy Transmission Contracts**

PEF provided the completed or planned Transmission contracts or contract addenda for materials and/or services with values in excess of \$100,000 that were executed in 2009 or planned for 2010.<sup>25</sup>

#### **Contracts Completed in 2009**

The following contracts with values in excess of \$100,000 were completed in 2009 for transmission activities:

- ◆ Route Selection Study (Golder Associates, Inc. contract number 0080678-00129) – To conduct route selection studies to identify constructible and permitable transmission line routes within Owner's proposed corridors. The final route study was completed on November 10, 2009.
- ◆ Owner's Engineer (Patrick Energy Services, Inc. contract number 00409194) – All the following work authorizations were terminated as of December 1, 2009:
  - WA 409194-00001 – (1) To provide engineering services to support the review, analysis and revisions as needed to all associated scopes, cost estimates, and schedules for Levy Program's individual projects. (2) To provide assistance for Levy Program engineering quantitative and qualitative efforts to support Requests for Information or Requests for Proposals. (3) To attend community open houses, general Levy Program meetings and provide expert staff and testimony.

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<sup>25</sup> PEF Response to Staff Data Request 1.24, BATES 0000048 – 0000049.

- ▶ WA 409194-00002 – Develop complete engineering design including Bill of material for the North Admin 69kV Tap/Transmission line.
  - ▶ WA 409194-00003 – Develop complete engineering design including Bill of material for the South Admin 69kV Tap/Transmission line.
  - WA 409194-00004 – Develop complete engineering design (physical layout, civil, structural, P&C) including Bill of material for the North Admin Substation.
  - ▶ WA 409194-00005 – Develop complete engineering design (physical layout, civil, structural, P&C) including Bill of material for the South Admin Substation.
  - ▶ WA 409194-00006 – Develop engineering services in support of the Kathleen-Lake Tarpon 230kV line rebuild project.
  - WA 409194-00008 – Develop preliminary design for the Central Florida South Substation.
- 
- ◆ Crystal River Switchyard Expansion Design & Engineering (Commonwealth Associates, Inc. contract number 436914-00001) – To provide engineering services, design, coordination of engineering services for the Crystal River Phase 1 Switchyard Project. This work authorization was terminated as of December 16, 2009.
  - ◆ Crystal River Switchyard Expansion Construction (Elite Construction of Ocala contract number 221227-00030) – Installation/commissioning of three 500kV Double end Break Switches and the associated support structures, substation bus and foundations – completed December 2009.
  - ◆ Environmental Resource Consulting (Golder Associates, Inc. contract number 453352-00001) – To provide detailed field information regarding the transmission line rights of way (ROW) and substations to support the Conditions of Certification (COCs) and the Final Environmental Impact Statement (FEIS). This work is ongoing.
  - ◆ Procurement of switches (Southern States P.O #407759) – To purchase three 500kV switches for the Crystal River Phase 1 Switchyard Project. These materials were received on August 24, 2009.

#### **Contracts Planned for 2010**

The following contracts with values in excess of \$100,000 are planned for execution and/or performance in 2010:

- ◆ Title & Closing (American Government Services) – To provide title work and closing services to support the proposed upgrade to the existing transmission system due to the proposed future Levy Nuclear Plant.
- ◆ Survey – To provide survey work to support the proposed upgrade to the existing transmission system due to the proposed future Levy Nuclear Plant.

### 2.3.2 Audit Staff Review of the Levy EPC contract

Audit staff reviewed the EPC contract and its current amendments to provide a summary of the EPC contract terms and conditions, its pricing structure, payment and schedule milestones, and the relative risk sharing between PEF and the Consortium. The initial contract was signed on December 31, 2008; with three amendments through March 2010. The third amendment addressed the long-term schedule shift for the project.

#### Pricing Structure

The EPC contract is comprised of [REDACTED]

[REDACTED]. The contract value at inception was [REDACTED].  
However, [REDACTED]

[REDACTED]. The contract defines the pricing options as:

- ◆ [REDACTED]
- ◆ [REDACTED]
- [REDACTED]
- ◆ [REDACTED]

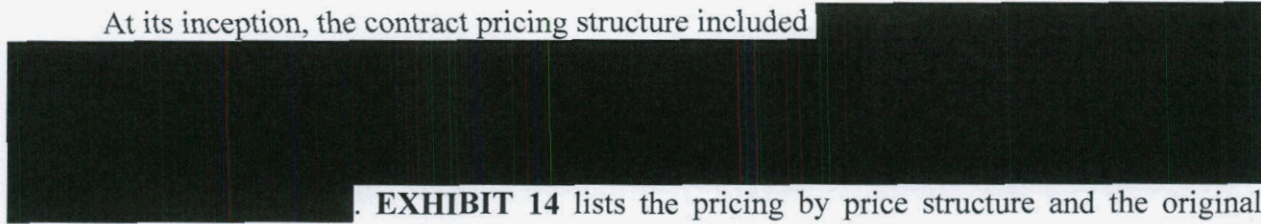
26

Due to long-term pricing uncertainty, it may not be optimal for fixed and firm pricing to be used exclusively within an extended contract such as those inherent in building a nuclear unit. Although over time, the price certainty will increase as the project schedule moves closer to implementation and the actual costs become more apparent. A large portion of the total contract

<sup>26</sup> PEF Contract Number 414310. Document No. 2379-10, Docket 100009-EI., Bates 000333-000338.

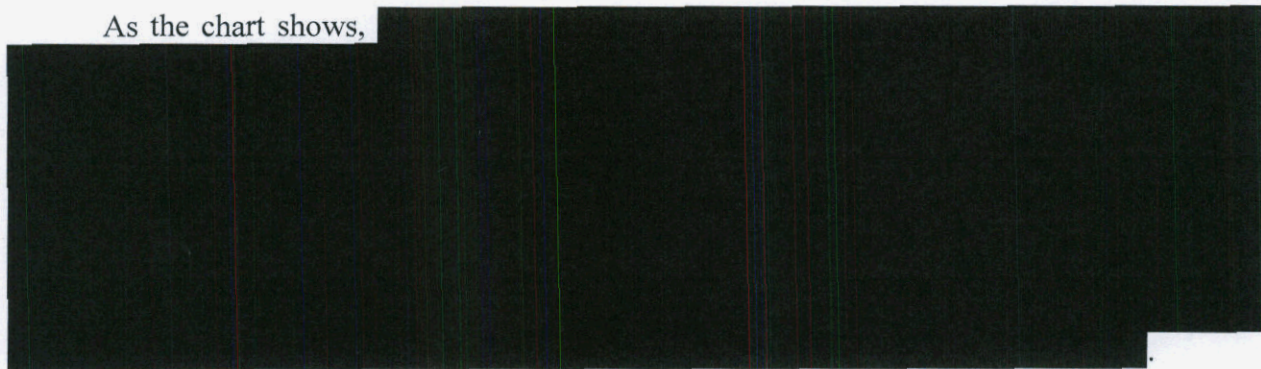
cost is for labor, equipment, and commodities. Vendors may be reluctant to lock-in these costs so many years prior to the need. To obtain totally fixed pricing, one would expect the contractor to charge a premium to guard against the added price risk.

At its inception, the contract pricing structure included



. EXHIBIT 14 lists the pricing by price structure and the original contract amount.

As the chart shows,



| PEF Levy EPC Contract Pricing Structure and Breakdown<br>(in millions) |                              |            |
|--|------------------------------|------------|
| Pricing Structure  | Amount at Contract Inception | Type       |
| [REDACTED]   | [REDACTED]                   | [REDACTED] |
| [REDACTED]   | [REDACTED]                   | [REDACTED] |
| [REDACTED]   | [REDACTED]                   | [REDACTED] |
| [REDACTED]   | [REDACTED]                   | [REDACTED] |
| [REDACTED]   | [REDACTED]                   | [REDACTED] |
| [REDACTED]   | [REDACTED]                   | [REDACTED] |

**EXHIBIT 14**

Source: PEF Contract Number 414310--Document No. 2379-10, Docket 100009-EI



[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

#### Contract Terms

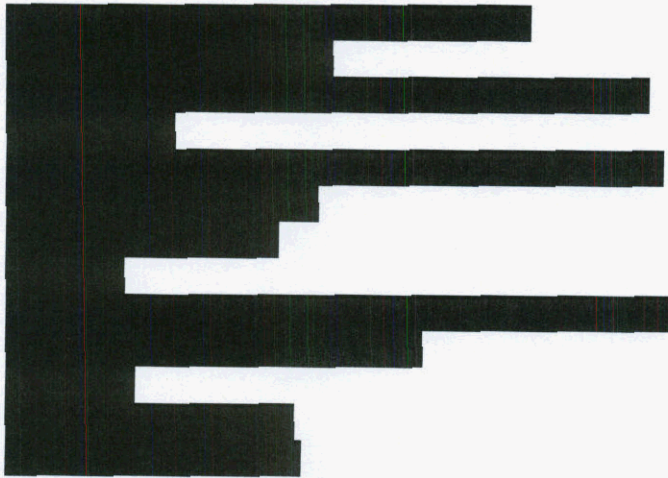
The terms and conditions of the EPC contract were evaluated by PricewaterhouseCoopers prior to the company signing the contract in 2008. The audit determined that the EPC contract was [REDACTED] of this type. The [REDACTED]:

[REDACTED]

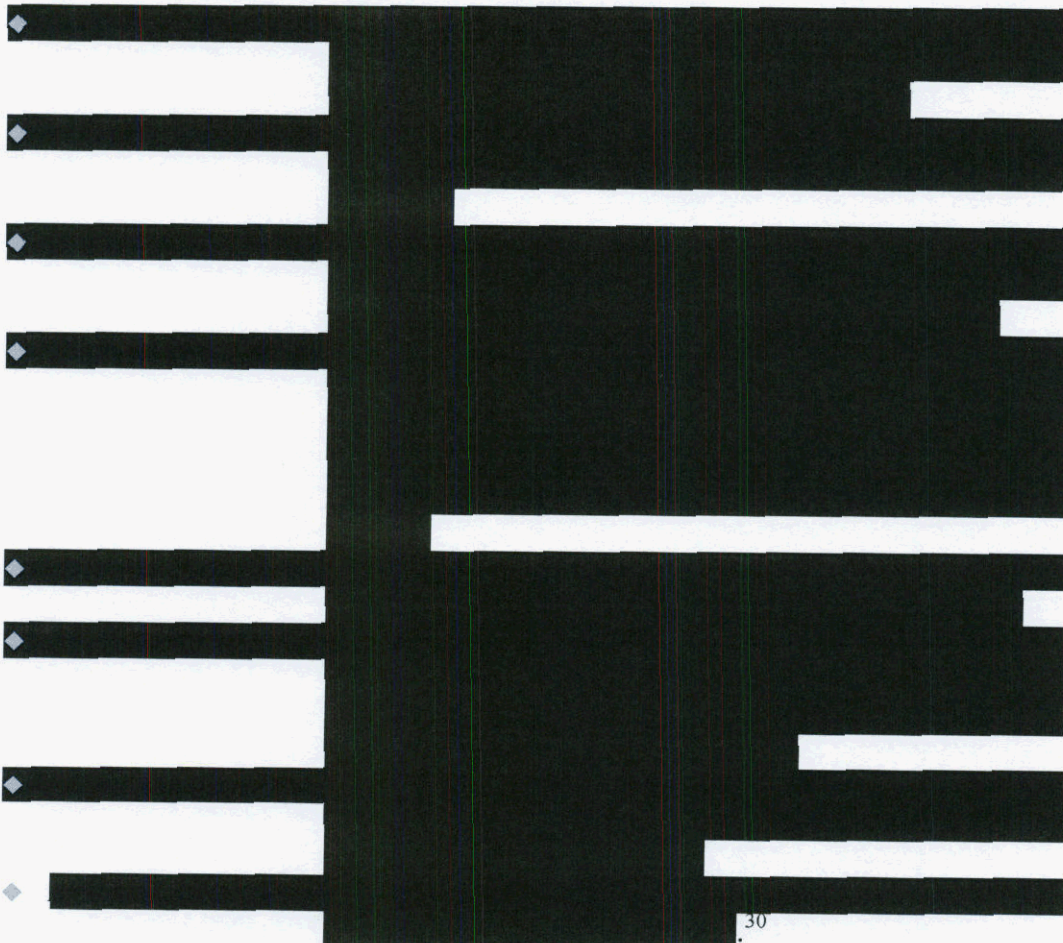
<sup>27</sup> PEF Response to Staff Data Request 6.2.

<sup>28</sup> Amendment Three maintains [REDACTED]

<sup>29</sup> PEF Contract Number 414310. Document No. 2379-10, Docket 100009-EI.



In addition to these major areas, the contract establishes detailed exhibits and matrices that address specific areas of the project. [REDACTED] exhibits include:



<sup>30</sup> PEF Contract Number 414310. Document No. 2379-10, Docket 100009-EI.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Audit staff notes that Progress Energy currently plans another AP1000 project at its Harris plant, which is part of its Carolina utility. Audit staff recommends the Commission monitor this project to ensure that the Carolina project, and its rate base, does not receive a cost reduction or cost exemption based on Progress Energy Florida's initial expenditure without adequate compensation.

#### **Amendments**

The company has amended the contract three times since its inception in December 2008. These amendments were all a result of the company decision to implement the long-term schedule shift. Amendment One and Two [REDACTED]

[REDACTED]

Amendment three, signed in March 2010, [REDACTED]

[REDACTED]

[REDACTED], the company will be required to re-negotiate all calendar-driven milestones prior to moving forward with the project. PEF management states that this will be a labor-intensive effort and anticipates that it [REDACTED]



## 3.0 Crystal River 3 Extended Power Uprate Project

### 3.1 EPU Key Project Developments

Progress Energy Florida completed Phase II of its three-phase EPU project during the fall 2009 refueling outage. This work included the installation and modification of the major balance of plant components necessary to support the additional MWe output. The company anticipates obtaining an additional 180 MWe output from the EPU project.

In addition to the EPU project, the company performed a steam generator replacement for CR3 during the outage. The generator work was independent and separate from the EPU project and did not directly impact the EPU project or scope. During the steam generator replacement, a delamination occurred in the concrete of the unit's containment vessel wall. This event caused the outage to extend past the planned 85-day timeline. The containment vessel delamination issue was solely the result of the steam generation project and in no way connected to the EPU project or work. The unit is still off-line as a result of the delamination repairs.

The delamination did not hinder nor impact the work performed for the EPU. The company was able to maintain its original EPU work schedule and complete all work identified for Phase II. However, the extended outage prevented the project team from completing certain testing requirements that can only be performed during start-up. The project team will perform this work at the appropriate time.

#### 3.1.1 Significant Events

The EPU project team states that all work was completed as scheduled and within the allotted budget. During the outage, the project team monitored the work performed for each major component and tracked variances and delays in the schedule. The project team issued daily project updates that tracked the target and actual schedules for each component. The team used these reports to monitor its vendors and identify potential issues. Audit staff reviewed these management reports and verified that the project remained on schedule with minor variances and no major issues were identified during the work.

Once the delamination issue was identified and it became evident that the outage would extend past the planned timeline, the EPU project team made the decision to remain on its original schedule. The team determined that the resources to complete the work were in place and on schedule to finish in the allotted timeline.

The project team estimated a project cost range for the Phase II work and the team states that the costs for the Phase II work was within the range. However, the project team did exceed its original estimates for certain costs during Phase II. Specifically, the company made adjustments for additional resources, such as labor and scaffoldings. These expenditures were contracted through a time and materials contract and remained within the original estimated range.

During the Phase II implementation, PEF's project team monitored the labor and vendor invoices daily to verify that all costs were reasonable and in line with the work scope. Each manager was responsible for monitoring their work assignment to ensure resources were managed accordingly. The Project Controls group oversaw the total overall cost and schedule during the project timeline. This group was responsible for monitoring and booking the costs associated with the work performed by the vendors. Project Controls also ensured the costs were within the budgeted scope and verified all approvals for any changes in scope or costs.

The company has not experienced any problems it considers to have jeopardized the project or its viability. However, there are two areas where the project team has re-evaluated its approach—the License Amendment Request Application process and the Low Pressure Turbine replacement. These two issues could have schedule and cost impacts on the project and are discussed below.

### **License Amendment Request Application**

The company must receive approval from the NRC to operate the unit at the higher output rate achieved by the EPU project. To initiate this request, the company must submit a License Amendment Request (LAR) with the NRC asking for an amendment to its current operating license. According to the company, the NRC review process should take approximately 14 months. Once approved, the company will be authorized to run the unit at the higher generation output.

It was the company's intent to submit the LAR application in September 2009. This would have provided the NRC approximately 24 months to complete the LAR application review process prior to the planned November 2011 Phase III outage. The company contracted with AREVA, the current owner of the Babcock & Wilcox, to complete its LAR along with an internal team made up from within its corporate licensing division to prepare the application.

The company stated that it prepared for the LAR application process by reviewing and monitoring prior LAR applications, particularly the Ginna Nuclear Plant application from 2005.<sup>31</sup> Also, the company utilized the resources of the Nuclear Energy Institute taskforce for uprates, which provided insight from other utilities completing similar projects. The company notes that this is the first Babcock & Wilcox plant of this type to undergo an EPU project of this scope. PEF created a template, using previous applications as its models, as the framework for completing the initial 116 sections of the LAR application.

The company states that the LAR application process is continually evolving as additional requests are reviewed by the NRC. In mid-2008, the NRC rejected the application for the Monticello Nuclear Plant uprate, specifically related to the NRC's expectation and depth of detail expected in a LAR application. This action caused concern throughout the industry. In addition, PEF states that the NRC's review and RAIs for the Point Beach Nuclear Plant application (submitted to the NRC in April 2009) signaled another significant shift in the depth of detail required in the applications by the agency.

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<sup>31</sup> Ginna was the most recent LAR approved by the NRC when the company initiated its licensing development.

#### Expert Panel

In June 2009, with the LAR work heading to completion, the company convened an "Expert Panel" to review the June 15, 2009 *Final Draft-CR3 EPU Licensing Report* and assess the application from "an NRC acceptance review perspective" and to verify the application contains "sufficient detail to allow NRC to independently conclude acceptability".<sup>32</sup> This panel consisted of both in-house nuclear operations staff and outside consultants versed in nuclear licensing. At the time of review, the company believed it was within three to four months of the LAR submittal. The company acknowledged that the draft "should have been of sufficient quality and content to support the scheduled submittal date of September 2009."<sup>33</sup> At the time, the company had completed 77 of the anticipated 116 sections.

The expert panel presented its analysis and results to company management on July 14, 2009. The panel concluded that the EPU draft would not pass the NRC acceptance review and that the company could not meet its fall 2009 submittal timeline. Specific issues identified in the review included:

- ◆ "Many CR-3 LR sections lack sufficient data";
- ◆ "Portions of many LR sections have been cut/paste from Ginna submittal without a thorough review". Specifically, the application contained Ginna-specific text that was not applicable to the CR3 unit;
- ◆ RAIs and Safety Evaluation issues raised by the NRC within the Ginna EPU application "were not considered or addressed in the CR-3 LR" application;
- ◆ "Quality was an issue in sections prepared both by AREVA and CR-3"<sup>34</sup>

In response to the Expert Panel's assessment, the company charged its Manager of Nuclear Regulation to conduct an Adverse Condition Investigation of the LAR process. The purpose of this investigation was to determine the root-cause of the issues identified by the Expert Panel. This investigation [REDACTED]

[REDACTED]:

[REDACTED]

[REDACTED]

<sup>32</sup> PEF Response to Staff Data Request CR3 1.14, Bates-002043.

<sup>33</sup> PEF Response to Staff Data Request CR3 1.14, Bates 002076.

<sup>34</sup> PEF Response to Staff Data Request CR3 1.14, Bates 002041-002047.

35

The company implemented a corrective action plan to resolve the issues identified by the panel and to strengthen the content of the application. The company hired outside consultants to assist with this restructuring. Specifically, the company determined that its original format template was not adequate in addressing the details necessary for the NRC review. The company developed a new template, which required AREVA and the licensing group to restructure the existing application. The Expert Panel completed two additional reviews through January 2010 to monitor the changes incorporated into the LAR application.

#### AREVA Change Orders

PEF contracted with AREVA to complete "CR3 EPU LAR Re-write Activities"<sup>36</sup> for previously drafted sections of the application. In October 2009, PEF initiated a change order on the AREVA contract for [REDACTED]

. In January 2010, the company increased this change order to [REDACTED].

Additionally in October 2009, the company initiated a separate contract change order to AREVA for [REDACTED] for additional LAR work. This work was a result of the Expert Panel evaluation and focused on [REDACTED]. This contract amount was increased in January 2010 to [REDACTED]<sup>39</sup>. As with the other change order, the increase was for the additional time it took to complete the engineering scope. In total, these two change orders added [REDACTED]<sup>40</sup> to the company's LAR expenditures.

Audit staff recognizes the important role of the Expert Panel and its critical evaluation had in insuring a complete and thorough LAR submittal to the NRC. Given the panel's findings, there was a potential for significant delays in the LAR approval process had the company not commissioned this detailed evaluation. Additionally, the company devised an initial schedule that included a float, which allowed for the necessary time needed for restructuring and strengthening of the application without impacting the project timing. Appropriately, the company performed a root-cause analysis to assess the reasoning for the deviances in its application and developed an action plan to resolve any outstanding issues.

While audit staff acknowledges the importance and value in the self-assessment process used by company, the findings of its Adverse Condition Investigation are concerning. This

<sup>35</sup> PEF Response to Staff Data Request CR3 1.14, Bates 002080-002081.

<sup>36</sup> PEF Response to Staff Data Request CR3 1.22, Bates 000081.

<sup>37</sup> Ibid. Bates 000080.

<sup>38</sup> PEF Response to Staff Data Request CR3 4.2, Bates 000001.

<sup>39</sup> Ibid. Bates 000011.

<sup>40</sup> Ibid. Bates 000021.

internal PEF investigation notes [REDACTED]  
[REDACTED]

The company points out that the regulatory review process is ever evolving and the NRC's expectations can differ based on the specifics of each application. PEF also believes that the NRC's expectations expanded during the time its licensing group developed its application; based on the NRC's handling of the Monticello and Point Beach EPU applications. The company states that this environment created an uncertainty and lack of expertise within the industry on LAR application. While this may be an accurate description of the evolution of the process, two of the four members of the expert panel were Progress Energy Carolina employees. This indicates that Progress Energy Corporation had the corporate knowledge to assess and evaluate an application. However, these needed resources were not deployed for the CR3 LAR work during the earlier stages of the process.

Audit staff believes the panel's findings were less about shifts in NRC expectations than project team knowledge and supervisory oversight. The company's internal [REDACTED]  
[REDACTED]

[REDACTED] While audit staff agrees that significant resources are necessary to complete the LAR application and the company's extensive efforts post-expert panel to revise its application may have been necessary to develop a sound application from the onset, significant resources were spent prior to developing the final draft. These resources may not have been appropriately supported by the company to allow for a successful outcome. As a result, avoidable-work may have been performed as corrective action work by AREVA and the additional efforts by PEF staff.

#### **Low Pressure Turbine Replacement**

As part of the EPU project, PEF contracted with Siemens for two 18m<sup>2</sup> low pressure turbines. Originally, the company included installation of these turbines as part of its Phase II work scope. However, in mid-2009 the company determined that it would shift the installation of the low pressure turbines from Phase II until Phase III of the project. At the time, PEF was still evaluating the impact of a major turbine failure at the D.C. Cook Nuclear Plant, which involved similar Siemens 18m<sup>2</sup> turbines. This 2008 event and resulting fire caused significant damage to that facility resulting in a costly repair and extended outage.

While PEF was monitoring the results of the D.C. Cook event, the company continued with the order of these turbines. [REDACTED] certain quality tests on this equipment. One quality assessment required the turbines to successfully operate at 120 percent of maximum output. The company refers to this as the "spin test." Siemens performed the spin test in April 2009, and the turbines did not pass this test. The turbines experienced disk slippage between the final blade components and the turbine's main shaft. After a detailed evaluation, [REDACTED]

[REDACTED] PEF informed Siemens that the turbines [REDACTED]  
[REDACTED]

In addition to concerns from the spin-test failure, PEF states that the D.C. Cook incident created an unwillingness by the Nuclear Electric Insurance Limited (NEIL)—the group that

insures nuclear plants against a variety of risks<sup>41</sup>—to insure any newly-installed Siemens 18m<sup>2</sup> turbine for its first two in-service fuel cycles. It was determined that the cause of the D.C. Cook failure was the 18m<sup>2</sup> model's L0 blades. According to PEF, [REDACTED]

The turbines are a critical component to maximizing the additional MWe output from the EPU efforts. The contracted Siemens model—18m<sup>2</sup>—allows for the maximum capture of steam, resulting in the largest MWe output. While the company states it anticipates resolving the current turbine issues and installing the Siemens 18m<sup>2</sup> model, management is evaluating several replacement options as a precaution. These options are shown in **EXHIBIT 15**.

| PEF CR3 Low Pressure Turbine Replacement Options and the Resulting MWe Output |   |                         |                   |
|---|---|-------------------------|-------------------|
|   | Option  | MWe output Added by EPU | Final Unit Output |
| <b>Option 1:</b>  | Continue Operating CR3 with its current Alstom Turbines   | 16 MWe                  | 916 MWe           |
| <b>Option 2:</b>  | Install the contracted Siemens 18m <sup>2</sup> as originally designed during Phase III *                               | 180 MWe                 | 1080 MWe          |
| <b>Option 3:</b>  | Install the contracted Siemens 18m <sup>2</sup> without the L0** blades during Phase III *                              | 100 MWe                 | 1000MWe           |
| <b>Option 4:</b>  | Install Siemens' smaller 13.9m <sup>2</sup> turbines in 2013 (additional time is needed to manufacturing the equipment) | 172 MWe                 | 1072 MWe          |

\* The 18m<sup>2</sup> must pass the spin test prior to installation.

\*\* The L0 blades were determined to be the cause of the D.C. Cook failure. According to PEF, [REDACTED]

## EXHIBIT 15

PEF Response to Staff Data Request CR3 3-8

In addition to the turbine options being considered by the company, PEF states it is in settlement negotiations with Siemens [REDACTED]

[REDACTED] The company states if its moves forward with the current 18m<sup>2</sup> turbines, it will require [REDACTED]

[REDACTED] PEF states it is optimistic that the negotiations will result in a positive outcome for the company and anticipates finalizing its turbine decision in mid-2010.

<sup>41</sup> www.nmlneil.com

### 3.1.2 Impact on Schedule and Cost

While there is no direct correlation between the work for the EPU project and the events leading to the delamination of the CR3 containment vessel, the completion of the EPU project will be delayed as a result of the delamination repair work necessary to bring the unit back online. The timeline for completing the necessary repairs is in flux. Originally, the company anticipated the unit to be operational in mid-2010; however, after further evaluating the repair scope, the company shifted its estimate for start-up to third quarter 2010.

This will require a shift in the refueling schedule 17 (R17). The final phase of the EPU project is currently scheduled to occur during the R17 outage. As of May 2010, the company anticipates the R17 to shift from fall 2011 to spring 2012. However, if additional delays arise in the delamination repair schedule, the R17 schedule could shift further out in time.

The company states the cost implications for the shift in R17 will not significantly impact the EPU project. Currently, the company does not anticipate any additional direct costs to the project other than costs associated with any cost escalations over time. However, the company does not have an estimate of the cost impact at this time. The total shift in schedule is anticipated at six to twelve months from the original November 2011 timeline.

While the company anticipates minimal cost-impact resulting from this schedule shift, audit staff recommends the Commission monitor for any additional EPC costs associated with the Phase III work. This schedule shift is a direct result of the delamination issue at CR3, and PEF and the NRC are investigating the root cause of this incident. Depending on the outcome of this investigation, additional EPC project costs related to the shift may need to be excluded from the NCRC docket and addressed separately.

#### Low Pressure Turbine

The company is currently assessing the overall impact of the Low Pressure Turbine installation on the project. The unresolved issues surrounding Siemens 18m<sup>2</sup> turbines resulted in a shift in installation from Phase II to Phase III. Because of this shift, there may be additional costs associated with the delivery and installation of the turbines during Phase III of the EPU. Additionally, the shift in installation required the company to adjust certain engineering designs for the Phase II work. This redesign required an additional work authorization with AREVA, totaling [REDACTED].

The company states it is currently negotiating a settlement with Siemens and anticipates that [REDACTED]. However, until the settlement is finalized, it remains to be seen whether the anticipated settlement [REDACTED]. Staff recommends that the Commission monitor the results of this process to ensure that the company only requests recovery of the appropriate costs and excludes any resulting from a possible vendor error.

In addition, if the company chooses not to move forward with its current Siemens low pressure turbine selection, there will be a decrease in the final MWe output for the project. If this occurs, an evaluation would be necessary to assess the appropriate handling of the reduction in planned versus achieved MWe output. In effect, the uprate would then have cost more per additional MWe added, and adjustments may be warranted.

### License Amendment Request

The company has shifted its LAR submittal timeline from 2009 to mid-to-late 2010. The company originally incorporated a float into its original schedule, and with the impact of the delamination repairs on the R17 outage, the company has gained additional float in its submittal window. Audit staff does not believe the delays resulting from the company's restructuring and revising its LAR application will ultimately impact the EPU schedule. The company states that the Phase III work will continue as scheduled, even if there is a delay in the LAR approval. If the company completes the work prior to approval, however, the unit will not be able to operate at the higher capacity prior to the NRC's issuance of an amended license.

The company increased its spending on the LAR preparations in 2009 and 2010. This was a result of the expert panel's assessment that the final draft would not meet the expectations of the NRC. The company estimated its 2009 License Application capital expenditures at [REDACTED]. However, the company spent an additional [REDACTED] on this effort. This was attributed, in part, to the additional work necessary to strengthen its LAR after the Expert Panel review. Of these additional costs, AREVA was paid [REDACTED].<sup>42</sup> Additionally, [REDACTED].

The company anticipates that through 2010, it will spend an [REDACTED] to complete its LAR efforts. PEF estimates that at completion, the LAR application process will cost approximately [REDACTED]. This represents a [REDACTED] over its original 2007 estimate of [REDACTED].<sup>43</sup> The company states the application is ready to submit to the NRC, but it does not anticipate filing the application until fall 2010.

### Overall Project Cost

The overall anticipated final cost of the EPU project has increased during the course of the project. The company originally anticipated the project to cost \$426.6 million, while the most recent estimate is \$479.4 million, a 12 percent increase.<sup>44</sup> The project team documented and updated these costs within its 2009 IPP, and received senior management's approval for the additional expenditures. The company states that the increases in costs include additions and modification to the engineering specifications and increases in labor and support costs.

## 3.2 EPU Project Controls and Oversight

### 3.2.1 Project Controls, Risk and Management Oversight Changes

As discussed in the context of the Levy plant, the company requires an *Integrated Project Plan* (IPP) for each major project implemented by the company. For both the Levy and the Crystal River 3 Uprate, the IPP establishes the financial requirements necessary to complete the project along with the project scope, deliverables, and risks associated with the project. Senior management uses this document to assess the overall feasibility of the project and to track the overall financial commitment for the project.

<sup>42</sup> PEF responses to Staff Data Request CR3 4.2, Bates-000001.

<sup>43</sup> PEF Response to Staff Data Request CR3 4.2, Bates-000021.

<sup>44</sup> PEF Response to Staff Data Request CR3 1.18.

### **Integrated Project Plan Revisions**

The initial *Business Analysis Package* (BAP) for the uprate project was completed in November 2006. It outlined the project's phases and a cost estimate of approximately \$427 million. This was comprised of a base \$250 million 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.

During 2008, PEF began to migrate major projects towards its new 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 provides a baseline for progress measurement and project control.<sup>45</sup>

The original IPP for the Crystal River 3 Extended Power Uprate project was initiated in March 2008, updated in March 2009 (Rev. 1), and further updated in October 2009 (Rev. 2). The changes made in October 2009 reflect the scope change related to Phase III work. With this revision, EPU project management requested an additional [REDACTED] (Financial View) cost between 2009 and 2011. The additional funding will be used on the following major items:<sup>46</sup>

#### **2009**

- ◆ Moved LP Turbine scope to 2011 – (\$15.5M)
- ◆ Reduced Cooling Tower Scope for Recirculation Line & Warehouse– (\$9.0M)
- ◆ Cross/NGG Fleet Support Charges - \$1.7M
- ◆ R16 Engineering Cost Increase - \$6.7M
- ◆ R17 Engineering Cost Increase - \$1.5M
- ◆ Augmented Staff Needed Earlier than Resource Shares Available--\$2.5M
- Atlantic Implementation - \$2.7M

#### **2010**

- ◆ R17 Purchase Major Component - \$8.7M
- ◆ R17 Engineering - \$12.0M
- ◆ Cooling Tower Recirculation Line - \$8.0M
- Staff Augmentation and Support - \$4.8M

#### **2011**

- ◆ LP Turbine Scope Moved from 2009 - \$18.0M
- ◆ R17 Major Components - \$5.0M

<sup>45</sup> FPSC's August 2008 *Review of PEF's Project Management Internal Controls for Nuclear Plant Uprate and Construction Projects*, page 10.

<sup>46</sup> PEF Response to Staff Data Request 1.8, BATES 000012 – 000014.

- ◆ Project Management Augmented Labor - \$2.6M
- ◆ R17 Temporary Facilities - \$3.0M

Project approval and updates will occur at critical milestone intervals. Planned updates are recommended as of this IPP revision. There is a request for review by the Progress Energy Senior Management Committee at each key milestone to allow prudent senior management evaluation of project progress and control.

According to PEF, in addition to SMC communications, project information is disseminated in both formal and informal methods. Stakeholder management through effective communication is vital. Formal information consists of written documents that are used for project studies, design documents, procurements, work assignments, project issues, status reports, schedules, presentations, meeting agendas, and other. Informal communications are generally verbal but may be written.<sup>47</sup>

### **Project Management Policies and Procedures**

PEF has procedures in place that direct the oversight and control of the Crystal River 3 Uprate project. The company created or updated these procedures as the project progressed and developed over time. Additionally, the company developed (and is continuing to refine) standard procedures for project management, through its *Project Management Center of Excellence*. These procedures cover areas including the evaluation and authorization process, project management, and organization/administration. A list of the seventeen new or recently revised Project Management procedures may be found in **APPENDIX E**.<sup>48</sup>

### **Oversight and Management Policies and Procedures for Contractors**

There have been no changes made to the Vendor Oversight Plan that was addressed during last year's review.<sup>49</sup> The company's revised oversight and management procedures for contractors working on the CR3 EPU project are shown in **EXHIBIT 16**, and are discussed below.<sup>50</sup>

| New or Revised CR3 Contractor Oversight and Management Procedures                  |                  |                                  |
|--|------------------|----------------------------------|
| Procedure Title  | Procedure Number | Procedure Revision Number (Date) |
| Standards & Expectations for the Acquisition and Training of Non-Station Personnel | AI-525           | Rev 25 (Nov-2009)                |
| Vendor Quality Program for Critical Non-Safety Equipment                           | NGGM-PM-0020     | Rev 6 (Sep-2009)                 |

**EXHIBIT 16**

Source: Data Request 1.27

<sup>47</sup> PEF Response to Staff Data Request 1.8, BATES 000027.

<sup>48</sup> PEF Response to Staff Data Request 1.9, BATES 0000013 – 0000014.

<sup>49</sup> PEF Response to Staff Data Request 1.30, BATES 0000043.

<sup>50</sup> PEF Response to Staff Data Request 1.27, BATES 0000039.

The *Standards and Expectations for the Acquisition and Training of Non-Station Personnel* (AI-525)<sup>51</sup> procedure establishes standards and expectations for control of Non-Station Personnel at Crystal River Unit 3 (CR3). It provides guidance for obtaining, training, and monitoring Vendor/Contractor, Shared Resources and interface organizations at CR3, including Supplemental Manpower.

The *Vendor Quality Program for Critical Non-Safety Equipment* (NGGM-PM-0020) procedure is intended to proactively schedule and determine quality assurance measures to be implemented prior to sending high risk critical equipment out for repair or acquiring new high risk critical equipment or major purchases. This helps ensure critical equipment and major purchases are repaired/purchased in a timely manner to support improved equipment reliability. A guide for performing vendor surveillance is included with this procedure. This procedure applies to both the Levy Nuclear Project and the Crystal River 3 Uprate.<sup>52</sup>

#### **Controls Implemented in 2009 or Planned for 2010**

PEF updated Nuclear Projects Guidance Documents, Financial Controls, Project Controls, and made enhancements to their organization as a result of quality assurance assessments, internal audits, and external audits. In addition, PEF implemented the following controls:

- ◆ ***Integrated Change Form***<sup>53</sup> (ICF) register  
In August 2009, the company implemented this register to aid in tracking the impact of approved ICFs against established project and annual budgets as a function of reduced contingency values. The register is reviewed at subsequent Project Review Group meetings.
- ◆ ***Daily Earned Value*** (Schedule Performance Index based on scheduled man-hours) was implemented during R16. Weekly Earned Value Reports are distributed to the Task Managers.
- ◆ ***Project Management Center of Excellence*** (PMCoE)  
The project began the transition to the corporate *Project Management Center of Excellence* (PMCoE) standards and procedures in January 2009. The project's risk assessment process has been integrated through implementation of the PMCoE.<sup>54</sup>

#### **Nuclear Projects Guidance Documents**

Several new Nuclear Projects Guidance Documents were created and/or revised as a result of quality assurance assessments, internal audits, and external audits. The documents created or revised are listed in **EXHIBIT 17**.

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<sup>51</sup> PEF Response to Staff Data Request 1.27, BATES 000001 – 000045.

<sup>52</sup> PEF Response to Staff Data Request 1.12A, BATES 000866 – 000904.

<sup>53</sup> PEF Response to Staff Data Request 1.35, BATES 000128.

<sup>54</sup> PEF Response to Staff Data Request 1.17, BATES 0000025.

| Created or Revised Nuclear Projects Guidance Documents<br>2009 |                  |
|--|------------------|
| Title  | Procedure Number |
| Information and Process Management                             | NPGD-002         |
| Staffing Management Plan                                       | NPGD-003         |
| Financial Controls Internal Invoice Audit Process              | NGPD-004         |
| Financial Group Invoice Processing                             | NGPD-006         |
| Financial End of Month Activities                              | NGPD-007         |
| Roll up Cost Management Report                                 | NGPD-008         |
| Nuclear Projects Cash Flow Projections True-up                 | NGPD-009         |
| Nuclear Projects Month-End Journal Entries                     | NGPD-010         |
| Project Budget Preparation                                     | NGPD-011         |
| Time Entry Guidelines  | NGPD-012         |

**EXHIBIT 17**

*Source: Data Request 1.35*

**Financial Controls**

Changes to financial controls were made in 2009 as a result of quality assurance assessments, internal audits, and external audits. These changes were:

- ◆ **Fleet standard financial controls for Major Projects** were established that included monthly reporting on Month to Date/Year to Date capital and O&M costs. Roll up cost management reports were distributed to senior management on the tenth business day of each month and Guidelines were established to formally establish the reporting process.
- ◆ **Monthly cash flow projection process** was begun. This consisted of reporting the updated Year End projection for each major project through the monthly Roll-up Major Projects Cost Management Report.
- ◆ **Month end activity working guideline** was created and approved by project controls management.
- ◆ **Earned Value Analysis** improvements were established so that reports were on the same frequency during the outage. A tracking methodology was also established to meet the reporting deadlines, and efficiencies were created with the interface with Guidant Timesheet that match the master contractor time sheet format.

**Project Controls**

Changes to project controls were made in 2009 as a result of quality assurance assessments, internal audits, and external audits. These changes were:

- ◆ Improvements to Nuclear Project Guidance Document NPGD-002 for Integrated Change Forms. A flow chart was added to simplify understanding of the process.

- ◆ Trigger points for the initiation of contingencies were added in the project schedules for items that were reviewed as high risk during the risk assessments.
- ◆ Improvements were made in estimating scope changes, budgetary refinements and project costs. An estimator was hired, and the company purchased Timberline estimating software which was installed, tested, and is now in use.
- ◆ Establishment of a consolidated list of tools, equipment and consumables. This provided better accountability of purchased tools used during the Extended Power Uprate during the R16 outage.

### Organization

The company states that it made enhancements to its project organization to better define roles and responsibilities. Organization structures for EPU were established with a project control center and discipline direct reports for engineering, planning, scheduling, and CAP. EPU management will have personnel in the station outage control center for communication and tracking of activities that affect station resources. The documents created or revised were:

- ◆ Nuclear Engineering & Services 2009-2011 Business Plan
- ◆ Extended Power Uprate (EPU) Project Engineering Change (EC) Quality; Field Implementation and Readiness; and Procurement Control/Vendor Oversight
- ◆ Life Cycle Management 20 Year Cost Report
- ◆ Quick Hit Self Assessment Earned Value Analysis
- ◆ EPU/SGR Tool and Material Inventory Control

### Risk Assessment and Mitigation

Project risk evaluations were conducted for the 2009 CR3 Uprate in accordance with the Progress Energy PMCoE (*Project Management Center of Excellence*) program. The procedure provides guidance on project risk management, including execution of the risk management process and reporting metrics.<sup>55</sup> Both the Levy Nuclear Project and the Crystal River 3 Uprate employ this procedure.<sup>56</sup> The standard probability and impact scales used by all Progress Energy Florida projects are provided in **APPENDIX F**.

### Risk Matrix

The process of communicating and consulting to/with key stakeholders on the status of the project relative to risk is facilitated through the use of a *Post Response Strategy Risk Matrix*. The risk matrix is a visual tool for indicating what degree of management involvement the project team requires to address the risk.

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<sup>55</sup> PEF Response to Staff Data Request 1.5, BATES 000006 – 000007.

<sup>56</sup> PEF Response to Staff Data Request 1.12B, BATES 000264 – 000280.



LP Turbines (R16 DC Cook Rotor Failure Analysis) had the status of “Triggered [Risk Occurred]”.

The mitigation strategy that management deployed for the triggered risk was to defer the installation of the Low Pressure Turbines. Management stated that based on Industry Operating Experience associated with the 18m<sup>2</sup> Low Pressure Turbine last stage blade failures at D.C. Cook in September of 2008 and the CR3 blade disc slippage during bunker spin testing in April 2009, the installation of the Low Pressure Turbine replacements at CR3 has been deferred. PEF required newly manufactured turbine parts after the spin test failure, which could not be delivered in 2009. PEF is currently negotiating with the turbine manufacturer and the insurance carrier regarding the Low Pressure Turbines, and evaluating its options, therefore, any impact on the project’s cost and schedule is unknown at this point.

#### **Changes to Management Oversight**

EPU management created an implementation organization during the summer of 2009. The basis of the change was to ensure that there were task managers to oversee the field activities during R16 and to manage the engineering work associated with R17. The expected benefits of the changes are ensured personal accountability to meet the schedule and cost goals of the project.<sup>61</sup>

Senior/Executive managerial changes have occurred during 2009. The Director of Major Projects and supervisor of the EPU Project Manager left Progress Energy in March 2009. The Director of Major Projects reported to the Vice President – Nuclear Engineering and Support. This Vice President filled the vacant Director role until June 2009. A new Director of Nuclear Upgrades (formerly Major Projects) was hired in June 2009. This position manages four nuclear power facilities (Crystal River 3, Harris, Brunswick and Robinson). A new Project Manager for the Crystal River 3 EPU project was hired in early 2009.<sup>62</sup>

#### **3.2.2 Internal Audits and Quality Assessments**

Progress Energy’s Audit Services Department (ASD) maintains an annual Construction Audit Strategy that solicits input from management, ranks potential audits based on risks, and establishes an annual audit plan. The 2009 CR3 Power Uprate audit focus areas used to rank audits based on risk are the same as those for the Levy Nuclear Plant discussed previously. The three internal audits performed by Progress Energy’s Audit Services Department for the EPU project during 2009 are shown in **EXHIBIT 19**. FPSC Audit staff reviewed these audits and does not consider the findings to be of particular concern. In each case, the findings were satisfactorily resolved by PEF management.

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<sup>61</sup> PEF Response to Staff Data Request 1.11, BATES 0000016.

<sup>62</sup> PEF Response to Staff Data Request 1.12, BATES 0000017.

| PEF Internal Audits Completed during 2009<br>for the EPU Project |                         |         |
|--|-------------------------|---------|
| Audit Title  | Project Number          | Opinion |
| Florida Nuclear Plant Cost Recovery Rule Compliance              | 20013334 A916           |         |
| Crystal River Construction Logistics Support                     | 20013334 A909           |         |
| CR3 EPU and SGR Projects   | 20013334 A906 &<br>A907 |         |

**EXHIBIT 19**

Source: Data Request 1.31

#### Planned 2010 Internal Audits

The internal audits planned for completion by Progress Energy's Audit Services Department in 2010 are shown in **EXHIBIT 20**.

| PEF Internal Audits Planned for 2010<br>for the EPU Project |                |             |
|---|----------------|-------------|
| Audit Title   | Project Number | Report Date |
| Florida Plant Cost Recovery                                 | 20010800 A1016 | TBD         |
| Crystal River 3 Extended Power Uprate                       | 20010800 A1003 | TBD         |

**EXHIBIT 20**

Source: Data Request 1.31

#### Quality Assurance Reviews and Audits

The Crystal River 3 Nuclear Oversight (NOS) Department is charged with inspecting and monitoring the nuclear safety work performed at the Crystal River 3 unit. The quality assurance reviews and audits are accomplished through performance-based, real-time observations, technical reviews, and interviews with personnel. Findings, when identified, are based on best practices or minimum acceptable standards or requirements. Identification of a finding does not indicate unsatisfactory performance unless specifically stated.

The six quality assurance reviews and audits completed in 2009 are shown in **EXHIBIT 21**. FPSC Audit staff reviewed these audits and does not consider the findings to be of particular concern. In each case, the findings were satisfactorily resolved according to PEF. There are currently no quality assurance reviews or audits planned for 2010.

| PEF Quality Assurance Reviews and Audits Performed for the EPU<br>2009               |               |                   |
|--|---------------|-------------------|
| Description  | Report Number | Completion Date   |
| Nuclear Projects Assessment  | C-MP-09-01    | July 22, 2009     |
| Focused Review of EPU Project Modification Package Review                            | C-MP-FR-09-06 | March 26, 2009    |
| Focused Review of Nuclear Projects ALARA Work Plans                                  | C-MP-FR-09-07 | September 3, 2009 |
| Focused Review of NP Material Acquisition and Contract Initiation and Administration | C-MP-FR-09-09 | June 9, 2009      |
| Focused Review of NP Document Control of Work Packages                               | C-MP-FR-09-10 | August 12, 2009   |
| Focused Review of NP Integrated Start-up and Test Activities                         | C-MP-FR-09-11 | September 3, 2009 |

**EXHIBIT 21**

*Source: Data Request 1.32*

**Quality Assurance - Contractors**

The Quality Assurance group conducted several vendor oversight trips throughout 2009. All contracted manufacturing and Purchase Orders have a Vendor Oversight Plan. Vendor Oversight Plans are documented, and Vendor Oversight Checklists are created to record the acceptance or rejection of contractual acceptance criteria. Post Trip Reports are prepared by the Progress Energy employee with designated responsibility. These reports capture observations and results, and any nonconformance and proposed resolutions. Non-Compliance Reports are written for identified deficiencies.

The Vendor Oversight Plan contains a Component Reliability Plan which includes the following applicable requirements:

- ◆ Asset Management Policy
- ◆ Zero Tolerance for Equipment Failure
- ◆ Equipment Reliability Process Guideline
- ◆ Vendor Quality Program for Critical Non-Safety Equipment

Vendor Oversight also involves Benchmarking and a Self-Assessment Plan.<sup>63</sup> Staff believes that the Vendor Oversight Plan is important, as evidenced by the disk slippage of the low pressure turbines during the "spin test". PEF's Quality Assurance group rejected the component because of the failure to meet contractual acceptance criteria.

<sup>63</sup> PEF Response to Staff Data Request 1.14, BATES 0000019.

### 3.3 EPU Contract Oversight and Management

PEF provided all RFPs issued and bid evaluations (both financial and technical) supporting the CR3 Uprate project contracts in excess of a \$100,000 bid.<sup>64</sup> A listing of the 2009 EPU contracts is provided in **EXHIBIT 22**.

| PEF Contracts Greater than \$1 Million for the EPU Project<br>as of December 31, 2009 |  |   |   |  |
|---|--|---|---|--|
| Company   | Contract<br>Number-<br>Work<br>Authorization | Description   | Original<br>Contract<br>Amount<br>(\$000's) | Estimate of<br>Final<br>Value<br>(\$000's) |
| AREVA-NP  | 101659 WA 84                                 | EPU NSSS Engineering, Fuel Engineering and LAR Support                          | ██████                                      | ██████                                     |
| Thermal Engineering International (TEI)   | 342253                                       | Purchase of Four Moisture Separator Reheaters (MSRs)                            | ██████                                      | ██████                                     |
| AREVA-NP  | 101659 WA 93                                 | EPU Balance of Plant and Turbine Bypass Valves                                  | ██████                                      | ██████                                     |
| Siemens   | 145569 WA 50                                 | CR3 Turbine Retrofit for EPU Including Supply of All Equipment and Installation | ██████                                      | ██████                                     |
| Yuba  | 355217                                       | CR3 Feedwater Heater and SC Cooler Replacement                                  | ██████                                      | ██████                                     |
| Barnhart Crane and Rigging Co.  | 384426                                       | Heavy Hauling   | ██████                                      | ██████                                     |
| MHF Logistical Solutions  | 47083-08                                     | Radiation Waste Disposal  | ██████                                      | ██████                                     |
| Mesa Associates, Inc.   | 221186-24                                    | Civil Engineering POD Cooling Tower   | ██████                                      | ██████                                     |
| Atlantic Group  | 3714 / 72&74                                 | CR3 R16 EPU Implementation Labor and Support                                    | ██████                                      | ██████                                     |
| Modspace  | 418171                                       | Lease of Two-Story Trailer for EPU  | ██████                                      | ██████                                     |
| Bartlett Nuclear  | 3707 / 43                                    | EPU Portion of Health Physics / Decontamination for R16                         | ██████                                      | ██████                                     |
| Bettle Plastics   | 450789                                       | Fiberglass Reinforced Piping for Helper Cooling Tower South                     | ██████                                      | ██████                                     |
| ITT   | 450795                                       | Four Intake Pumps for HCTS  | ██████                                      | ██████                                     |
| EvapTech  | 433059                                       | CR3 Cooling Tower Construction  | ██████                                      | ██████                                     |

**EXHIBIT 22**

Source: Exhibit WG-2, Schedule T-7, March 1, 2010 Testimony 100009-EI

The AREVA contract, change order 23, increased the Work Authorization value by ██████ on a time and materials basis for CR3 LAR re-write activities. ██████

<sup>64</sup> PEF Response to Staff Data Request 1.24, BATES 0000035.

[REDACTED] Change Order 25 increased the Work Authorization value by [REDACTED] on a time and materials basis for [REDACTED].

AREVA contract, change order 31, increased the Work Authorization value by [REDACTED] on a time and materials basis to support revisions to the design models due to the deferral of the LP turbine. [REDACTED]

[REDACTED] PEF is working with Siemens and NEIL to resolve the manufacturing issues, final costs and schedule.

#### **Planned Contracts for 2010**

Engineering design specifications of material are scheduled and are progressing for the remaining EPU work scope. After the engineering design specifications are issued, the procurement of material will begin. The company states it has used a competitive-bid RFP process for all its contracts and materials. The procurement of material is scheduled with end dates selected to support the pre-outage milestones established by outage and project management.

Long-lead items that have been identified to date<sup>65</sup> include:

- ◆ Feed Water Booster Pump Motors
- ◆ Condensate Pump Motors
- ◆ Atmospheric Dump Valves
- Safety Related Motor Operated Valves
- ◆ Low Pressure and High Pressure Injection Components

The contracts planned for 2010 (R17)<sup>66</sup> are in their initial bid process. These contracts and their status are:

- POD/HCTS Supporting Structures – vendor selection expected in early 2010
- Booster Feed Pumps – RFP under development
- Condensate Pumps – RFP under development
- ◆ Atmospheric Dump Valves – RFP under development
- Feed Pump / Main Impeller – specification under development
- ◆ Main Feed Pump turbine re-rate – specification under development
- ◆ Motor Operated Valves – specification under development
- ◆ LPI Cross Tie – specification under development

As noted previously, PEF is continuing negotiations with Siemens and NEIL regarding the LP Turbine issue. Based on documentation reviewed by FPSC staff, the company appears to have followed its procurement procedures for initiating and implementing its EPU contracts. Staff recognizes that many remaining contracts for the EPU project will be initiated in 2010.

<sup>65</sup> PEF Response to Staff Data Request 1.19, BATES 0000028.

<sup>66</sup> PEF Response to Staff Data Request 1.21, BATES 0000030.

### **Contractor Selection and Management Policies and Procedures**

PEF recently revised three procedures for the CR3 project which are shown in **APPENDIX G**. Plans, forms and checklists are incorporated throughout these procedures.

The *Corporate Contracting Process* (CNT-SUBS-00001) procedure provides instruction for the development, review, approval, issuance, revision and administration of contracts. This procedure provides the detailed requirements necessary for compliance with Progress Energy's *Procurement Policy* (MCP-SUBS-00002) regarding the contracting process.<sup>67</sup>

The *NGG Contract Initiation, Development and Administration* (MCP-NGGC-0001) procedure provides instruction for the initiation, development, and administration of contracts with the Nuclear Generation Group with certain exceptions. This procedure also pertains to the procurement for nuclear fuels, but does not replace appropriate corporate and plant fuel receipt/handling procedures.<sup>68</sup>

The *Contractor Safety* (SAF-SUBS-00041) procedure provides guidance for compliance with OSHA standards and Company Safety Policies.<sup>69</sup>

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<sup>67</sup> PEF Response to Staff Data Request 1.26, BATES 000003.

<sup>68</sup> PEF Response to Staff Data Request 1.26, BATES 000059.

<sup>69</sup> PEF Response to Staff Data Request 1.26, BATES 000050.

## 4.0 Conclusions

This section provides audit staff's summary of observations regarding the two nuclear projects underway in Florida during the review period of 2009 through May 2010.

### 4.1 Levy Nuclear Project

#### 4.1.1 Project Events and Developments

During 2009, PEF redirected its focus of the Levy Nuclear Project from construction to regulatory approval. The company has delayed the project by a minimum of 60 months, pushing out preconstruction to 2013 and the start of major construction activities until at least 2015. The current focus is to obtain the COL approval from the NRC and then re-evaluate the construction timeline. Because the company has an Engineering, Procurement, and Construction contract with the Consortium to start construction on the Levy project in 2012, the decision to shift the schedule required renegotiation of the terms of the contract.

During the company's reevaluation of the project schedule, it considered several scenarios ranging from a 24-month delay to full cancellation of the project. In the end, the company decided to shift the construction start date to within 365 days after the issuance of the COL, which is currently anticipated for late 2012 or early 2013. The company believes this will result in a shift in the in-service dates to 2021 and 2022 for the two units.

The company was successful in negotiating an amendment to its EPC contract with the Consortium incorporating this new schedule timeline. In doing so, PEF was [REDACTED]

As a result of the shift a schedule, the company has worked with the Consortium to address the outstanding purchase orders under the contract for its long-lead items. These purchase orders are for [REDACTED] major components for a total cost of approximately [REDACTED]. The company anticipates it will cost upwards of an additional [REDACTED] to finalize the disposition of these purchase orders. This cost is directly related to the shift in schedule.

PEF estimates that there will be an increase in total project costs as a result of the shift in schedule. In 2008, the company estimated the total project cost, excluding AFUDC, at [REDACTED]. The 2010 estimate, using the 2021/2022 in-service date as its base, projects the total cost at [REDACTED]. This represents an approximate increase of [REDACTED].

#### 4.1.2 FPSC Audit Staff Conclusion

Audit staff recognizes that several internal and external factors influenced the company's decision to shift its construction schedule for the Levy project. This was based on several key assumptions by PEF. First, the company's internal assessment that the project is still a viable

and feasible option and that there is a standing determination of need issued by the Commission. Second, the delay in Westinghouse receiving NRC approval of its final design certification. Third, the economic downturn and recent lower demand within the State. Last, the uncertainty in the proposed Federal carbon legislation. Given the uncertainties facing the company, audit staff recognizes that keeping the project progressing, without further substantial investment of cost, is a reasonable approach by PEF at this point in time.

## 4.2 Crystal River 3 Extended Power Uprate Project

In 2009, PEF completed Phase II of the Extended Power Uprate project at the Crystal River Unit 3. The company states that all work was completed as scheduled and within the allotted budget. During the outage, the PEF project management team monitored the work performed for each major component and tracked variances and delays in the schedule.

### 4.1.1 Project Events and Developments

Overall, the company anticipates the total EPU project cost to be \$479.4 million (excluding AFUDC and joint owner commitments). This represents a 12 percent increase from the original \$426.6 million estimates. Through its Integrated Project Plan process, the company has documented the additional costs and received senior management approval to increase these expenditures over time. The company believes that this increase is within an acceptable range for a project of this size and complexity.

During the fall 2009 outage, the company discovered a delamination within the wall of the unit's containment vessel. This was identified during the work to replace the unit's steam generators—a separate and independent project from the EPU. The delamination repair has extended the original outage through at least fall 2010. This extended outage will impact the EPU's phase III schedule. Originally, the company planned to finish the EPU work scope during the next refueling outage, scheduled for fall 2011. However, PEF has shifted the outage to at least spring 2012.

In mid-2009, PEF made the decision to defer the installation of its two low pressure turbines from Phase II to Phase III work scope. This decision required the company to spend [REDACTED] restructuring its Phase II work scope to accommodate this change. Two factors influenced this decision: the turbines failing a [REDACTED] quality assessment test and the ability to adequately insure this turbine model. The company is currently negotiating a resolution with Siemens, the turbine manufacturer, to resolve the outstanding issues. Also, the company is considering the following turbine options: continue operating CR3 with its current Alstom turbines, install the 18 square meter Siemens turbines during Phase III as originally designed, install the 18 square meter Siemens turbines during Phase III with the L0 blades removed, or install smaller 13.9 square meter Siemens turbines in 2013.

Additionally, if the company chooses not to move forward with its current Siemens low pressure turbine selection, there will be a decrease in the final MWe output for the project. If this occurs, an evaluation may be necessary to assess the appropriate handling of the reduction in

planned versus achieved MWe output. In effect, the uprate would then have cost more per additional MWe.

Prior to the company implementing the EPU changes, PEF must receive approval from the NRC to operate at the higher MWe output. This is achieved through an amendment to the company current operating license. The company initiated its License Amendment Request application in 2007. In June 2009 PEF commissioned an "Expert Panel" to review its *Final Draft-CR3 EPU Licensing Report*. The panel determined that the application would not receive NRC approval as written, requiring the company to expend resources to strengthen the submittal. The company's internal findings [REDACTED]

[REDACTED]. In total, the company contracted with AREVA for an [REDACTED] to complete the required restructuring/rewrite of the LAR and [REDACTED] for additional engineering scope-related work.

#### 4.2.2 FPSC Audit Staff Conclusions

As a result of the events described in Section 4.2.1, FPSC audit staff draws the following conclusions:

- ◆ Audit staff recommends the Commission monitor the EPU project for potential cost impacts resulting from scheduling delays caused by the delamination issue.
- ◆ Audit staff recommends that the Commission monitor the results of the Siemens turbine negotiations to ensure that PEF recovers all the appropriate costs, and excludes any costs resulting from a possible vendor error.
- ◆ Audit staff recommends that the Commission monitor the Siemens negotiations to assess the appropriate handling of any reduction in planned versus achieved MWe output resulting from any change to the original turbine design option.
- ◆ Audit staff recommends that the Commission consider whether the additional [REDACTED] for the LAR restructuring/rewrite and the additional engineering scope by AREVA resulted from inadequate management oversight.



## 5.0 Appendices

| Levy Revised<br>Project Management Procedures |                                   |   |
|---|-----------------------------------|---|
| Procedure Number                              | Procedure Revision Number /(Date) | Procedure Title   |
| NGGD-1000                                     | Rev 2 (Oct-2009)                  | Nuclear Generation Group Fleet Alignment Manual   |
| NGGM-PM-0007                                  | Rev 16 (Nov-2009)                 | Quality Assurance Program Manual  |
| NGGM-PM-0012                                  | Rev 5 (Apr-2009)                  | NGG Change Management Program   |
| NGGM-PM-0017                                  | Rev 12 (Nov-2009)                 | NGGD Document Hierarchy   |
| NGGM-PM-0020                                  | Rev 6 (Sep-2009)                  | Vendor Quality Program for Critical Equipment & Major Purchases                                   |
| NGGM-PM-0023                                  | Rev 2 (Aug-2009)                  | Workforce Attrition Management Program  |
| NGGM-PM-0030                                  | Rev 3 (Sep-2009)                  | Quality Assurance Plan for the Development of New Nuclear Plants                                  |
| NGGM-PM-0033                                  | Rev 2 (Aug-2009)                  | New Nuclear Plant Development Quality Assurance Program Description Topical Report                |
| PRO-NGGC-0200                                 | Rev 10 (May-2009)                 | Procedure Use and Adherence   |
| PRO-NGGC-0201                                 | Rev 19 (Aug-2009)                 | NGG Standard Procedure Writer's Guide   |
| PRO-NGGC-0203                                 | Rev 13 (Mar-2009)                 | Development and Approval of NGG Directives, Interface Agreements, and Program Manuals             |
| PRO-NGGC-0204                                 | Rev 15 (Jan-2009)                 | Procedure Review and Approval   |
| CAP-NGGC-0200                                 | Rev 28 (Jul-2009)                 | Corrective Action Program   |
| CAP-NGGC-0201                                 | Rev 13 (Jul-2009)                 | Self-Assessment/Benchmarking Programs   |
| CAP-NGGC-0202                                 | Rev 16 (Sep-2009)                 | Operating Experience Program  |
| CAP-NGGC-0205                                 | Rev 9 (Feb-2009)                  | Significant Adverse Condition Investigations and Adverse Condition Investigations-Increased Rigor |
| CAP-NGGC-0206                                 | Rev 4 (Aug-2009)                  | Corrective Action Program Trending and Analysis   |
| CSP-NGGC-2505                                 | Rev 11 (Oct-2009)                 | Software Quality Assurance and Configuration Control of Business Computer Systems                 |
| EGR-NGGC-0011                                 | Rev 13 (July-2009)                | Engineering Product Quality   |
| EGR-NGGC-0021                                 | Rev 2 (Oct-2009)                  | Nuclear Generation Group Common Conduct of Engineering Operations                                 |
| EGR-NGGC-0157                                 | Rev 4 (Jan-2009)                  | Engineering of Plant Digital Systems and Components   |
| MCP-NGGC-0001                                 | Rev 14 (Mar-2009)                 | NGG Contract Initiation, Development, and Administration  |
| MCP-NGGC-0002                                 | Rev 17 (Aug-2009)                 | Purchasing of Materials for NGG   |
| MCP-NGGC-0004                                 | Rev 4 (Oct-2009)                  | Training of Contract Development Personnel  |
| MCP-NGGC-0401                                 | Rev 27 (Oct-2009)                 | Material Acquisition (Procurement, Receiving, and Shipping)                                       |
| NOS-NGGC-0100                                 | Rev 4 (Sep-2009)                  | Nuclear Oversight Assessment Process  |
| NOS-NGGC-0102                                 | Rev 1 (Dec-2009)                  | Nuclear Oversight Committees  |
| NOS-NGGC-0601                                 | Rev 1 (May-2009)                  | Certification of Quality Control Inspectors   |
| NOS-NGGC-1000                                 | Rev 6 (Oct-2009)                  | Nuclear Oversight Conduct of Operations   |
| RDC-NGGC-0001                                 | Rev 21 (Nov-2009)                 | NGG Standard Records Management Program   |
| RDC-NGGC-0002                                 | Rev 20 (Sep-2009)                 | Document Control Program  |
| NGGS-PRO-0001                                 | Rev 13 (Nov-2009)                 | NGGS Procedure Review and Approval Process  |
| NGGS-NPD-0001                                 | Rev 3 (Sep-2009)                  | Process for Document Reviews and Affirmation  |
| NGGS-EPC-0203                                 | Rev 2 (Aug-2009)                  | EPC Contract Change Control   |
| NGGS-EPC-0300                                 | Rev 1 (Feb-2009)                  | Engineering, Procurement, and Construction Contract Engineering Document Reviews                  |
| NGGS-EPC-0400                                 | Rev 1 (Apr-2009)                  | EPC Contract Consortium Schedule Performance Oversight  |
| ACT-SUBS-00002                                | Rev 15 (Sep-2009)                 | Progress Energy Corporate Approval Level Policy   |
| ACT-SUBS-00271                                | Rev 5 (Mar-2009)                  | Progress Energy Business Analysis Package   |
| ADM-SUBS-00080                                | Rev 1 (Dec-2009)                  | Major Capital Projects – Integrated Project Plan  |
| CNT-SCDX-00001                                | Rev 2 (Jun-2009)                  | Supply Chain Internal Contract Process  |
| CNT-SUBS-00001                                | Rev 18 (Jun-2009)                 | Corporate Contracting Process   |
| CNT-SUBS-00007                                | Rev 4 (Nov-2009)                  | Contract Management Compliance  |
| MCP-SUBS-00002                                | Rev 5 (Nov-2009)                  | Procurement Policy  |
| MCP-SUBS-00010                                | Rev 14 (Nov-2009)                 | Corporate Procurement Process-Materials   |
| MCP-SVCO-00001                                | Rev 3 (Nov-2009)                  | Supply Chain Approval Level Policy  |
| RDC-SCDX-00001                                | Rev 3 (May-2009)                  | Supply Chain Contract Document Center Management Practices  |
| SAF-SUBS-00041                                | Rev 10 (Jun-2009)                 | Contractor Safety   |

### APPENDIX A

Source: Data Request 1.12

| New Levy<br>Project Management Procedures |   |  |
|---|---|--|
| Procedure Number                          | Procedure<br>Revision Number<br>/(Date) | Procedure Title  |
| PJM-SUBS-00001                            | Rev 1 (May-2009)                        | Achieving Excellence in Project Management   |
| PJM-SUBS-00003                            | Rev 0 (May-2009)                        | Project Scope Management   |
| PJM-SUBS-00004                            | Rev 0 (May-2009)                        | Project Time Management  |
| PJM-SUBS-00005                            | Rev 0 (Jul-2009)                        | Project Cost & Financial Management  |
| PJM-SUBS-00006                            | Rev 0 (Aug-2009)                        | Project Quality Management   |
| PJM-SUBS-00007                            | Rev 1 (May-2009)                        | Project Resource Management  |
| PJM-SUBS-00008                            | Rev 0 (Mar-2009)                        | Project Risk Management  |
| PJM-SUBS-00009                            | Rev 0 (Jun-2009)                        | Project Communication Management   |
| PJM-SUBS-00010                            | Rev 0 (May-2009)                        | Project Procurement Management   |
| PJM-SUBS-00011                            | Rev 0 (Nov-2009)                        | Project Environmental Health & Safety Management   |
| PJM-SUBS-00012                            | Rev 0 (Nov-2009)                        | Project Earned Value Management  |
| PJM-SUBS-00013                            | Rev 0 (Sep-2009)                        | Project Lessons Learned Management   |
| PJM-SUBS-00014                            | Rev 0 (Aug-2009)                        | Project Claim Management   |
| PJM-SUBS-00015                            | Rev 0 (Jul-2009)                        | Project Close Management   |
| PJM-SUBS-00016                            | Rev 0 (Jul-2009)                        | Project Manager Training Development Program   |
| EGR-PGNF-00001                            | Rev 0 (Sep-2009)                        | Agreement for Generation & Transmission<br>Construction Department and Transmission<br>Operations & Planning Department – Florida                                |
| MGT-NPDF-00001                            | Rev 1 (Dec-2009)                        | Levy Program Governance Policy   |
| REI-NPDF-00001                            | Rev 0 (Dec-2009)                        | Real Estate Governance Document  |
| NGGM-IA-0047                              | Rev 0 (Jun-2009)                        | Interface Agreement Between the Nuclear Generation<br>Group and Progress Energy Florida Regarding NGG<br>Support for the Nuclear Plant Development<br>Department |
| NGGS-EPC-0104                             | Rev 0 (May-2009)                        | EPC Contract Establishment of Project Policies and<br>Procedures   |
| NGGS-EPC-0105                             | Rev 0 (Feb-2009)                        | EPC Contract Facility Licenses, Permits, and<br>Approvals Responsibility   |
| NGGS-EPC-0106                             | Rev 0 (May-2009)                        | EPC Contract Periodic Updates  |
| NGGS-EPC-0108                             | Rev 0 (Jul-2009)                        | EPC Contract Dispute Resolution  |
| NGGS-EPC-0112                             | Rev 0 (Jun-2009)                        | EPC Contract Approval Authority for Change Orders<br>and Addenda   |
| NGGS-EPC-0201                             | Rev 0 (Apr-2009)                        | EPC Contract Sales & Use Tax Compliance  |
| NGGS-EPC-0202                             | Rev 0 (Apr-2009)                        | EPC Contract Consortium Subcontracting   |
| NGGS-EPC-0203                             | Rev 1 (Jul-2009)                        | EPC Contract Change Control  |
| NGGS-EPC-0204                             | Rev 0 (Mar-2009)                        | EPC Contract Price Adjustment Provisions   |
| NGGS-EPC-0400                             | Rev 0 (Mar-2009)                        | EPC Contract Consortium Schedule Performance<br>Oversight  |
| NGGS-NPD-0006                             | Rev 0 (Dec-2009)                        | Inspection, Test, Analysis and Acceptance Criteria<br>(ITAAC) Control Program  |
| NGGS-NPD-0009                             | Rev 0 (Aug-2009)                        | Screening for Preconstruction Activities   |

## APPENDIX B

Source: Data Request 1.12

| Project Management Center of Excellence<br>Project Management Procedures |   |   |
|--|---|---|
| Procedure Number   | Procedure<br>Revision Number<br>/(Date) | Procedure Title                                     |
| PJM-SUBS-00001   | Rev 1 (May-2009)                        | Achieving Excellence in Project Management          |
| PJM-SUBS-00003   | Rev 0 (May-2009)                        | Project Scope Management                            |
| PJM-SUBS-00004   | Rev 0 (May-2009)                        | Project Time Management                             |
| PJM-SUBS-00005   | Rev 0 (Jul-2009)                        | Project Cost & Financial Management                 |
| PJM-SUBS-00006   | Rev 0 (Aug-2009)                        | Project Quality Management                          |
| PJM-SUBS-00007   | Rev 1 (May-2009)                        | Project Resource Management                         |
| PJM-SUBS-00008   | Rev 0 (Mar-2009)                        | Project Risk Management                             |
| PJM-SUBS-00009   | Rev 0 (Jun-2009)                        | Project Communication Management                    |
| PJM-SUBS-00010   | Rev 0 (May-2009)                        | Project Procurement Management                      |
| PJM-SUBS-00011   | Rev 0 (Nov-2009)                        | Project Environmental Health & Safety<br>Management |
| PJM-SUBS-00012   | Rev 0 (Nov-2009)                        | Project Earned Value Management                     |
| PJM-SUBS-00013   | Rev 0 (Sep-2009)                        | Project Lessons Learned Management                  |
| PJM-SUBS-00014   | Rev 0 (Aug-2009)                        | Project Claim Management                            |
| PJM-SUBS-00015   | Rev 0 (Jul-2009)                        | Project Close Management                            |
| PJM-SUBS-00016   | Rev 0 (Jul-2009)                        | Project Manager Training Development Program        |

**APPENDIX C**

*Source: Data Request 1.19*

| Levy New or Revised<br>Contractor Selection and Management Procedures |   |  |
|---|---|--|
| Procedure<br>Number   | Procedure<br>Revision Number<br>/(Date) | Procedure Title  |
| ACT-SUBS-00002  | Rev 15 (Sep-2009)                       | Progress Energy Corporate Approval Level Policy  |
| CNT-SCDX-00001  | Rev 2 (Jun-2009)                        | Supply Chain Internal Contract Process   |
| CNT-SUBS-00001  | Rev 18 (Jun-2009)                       | Corporate Contracting Process  |
| CNT-SUBS-00007  | Rev 4 (Nov-2009)                        | Contract Management Compliance   |
| CNT-SUBS-00008  | Rev 1 (Nov-2008)                        | Contract Management Compliance Program Details   |
| MCP-NGGC-0001   | Rev 14 (Mar-2009)                       | NGG Contract Initiation, Development and Administration  |
| MCP-NGGC-0406   | Rev 12(Jan-2009)                        | Supplier Qualification, Surveillance, and Audits   |
| MCP-SUBS-00002  | Rev 5 (Nov-2009)                        | Procurement Policy   |
| MCP-SVCO-00001  | Rev 3 (Nov-2009)                        | Supply Chain Approval Level Policy   |
| NGGS-EPC-0100   | Rev 0 (Feb-2009)                        | Engineering, Procurement, and Construction Contract – Contractor's Organization                                    |
| NGGS-EPC-0101   | Rev 0 (Feb-2009)                        | Engineering, Procurement, and Construction Contract – Records Management   |
| NGGS-EPC-0102   | Rev 0 (Feb-2009)                        | Engineering, Procurement, and Construction Contract – Notices, Communications, and Approvals                       |
| NGGS-EPC-0103   | Rev 0 (Feb-2009)                        | Engineering, Procurement, and Construction Contract – Routine and General Correspondence                           |
| NGGS-EPC-0104   | Rev 0 (May-2009)                        | Engineering, Procurement, and Construction Contract – Establishment of Project Policies and Procedures             |
| NGGS-EPC-0105   | Rev 0 (Feb-2009)                        | Engineering, Procurement, and Construction Contract – Facility Licenses, Permits, and Approvals Responsibility     |
| NGGS-EPC-0106   | Rev 0 (Feb-2009)                        | EPC Contract Periodic Updates  |
| NGGS-EPC-0108   | Rev 0 (Jul-2009)                        | EPC Contract Dispute Resolution  |
| NGGS-EPC-0112   | Rev 0 (Jun-2009)                        | EPC Contract Approval Authority for Change Orders and Addenda  |
| NGGS-EPC-0200   | Rev 0 (Feb-2009)                        | Engineering, Procurement, and Construction Contract – Invoice Validation and Processing                            |
| NGGS-EPC-0201   | Rev 0 (Apr-2009)                        | EPC Contract Sales & Use Tax Compliance  |
| NGGS-EPC-0202   | Rev 0 (Apr-2009)                        | EPC Contract Consortium Subcontracting   |
| NGGS-EPC-0203   | Rev 2 (Aug-2009)                        | EPC Contract Change Control  |
| NGGS-EPC-0204   | Rev 0 (Mar-2009)                        | EPC Contract Price Adjustment Provisions   |
| NGGS-EPC-0300   | Rev 1 (Feb-2009)                        | Engineering, Procurement, and Construction Contract – Engineering Document Reviews                                 |
| NGGS-EPC-0301   | Rev 0 (Feb-2009)                        | Engineering, Procurement, and Construction Contract – Intellectual Property and Proprietary Information Management |
| NGGS-EPC-0400   | Rev 1 (Apr-2009)                        | EPC Contract Consortium Schedule Performance Oversight   |
| RDC-SCDX-00001  | Rev 3 (May-2009)                        | Supply Chain Contract Document Center Management Practices   |
| SAF-SUBS-00041  | Rev 10 (Jun-2009)                       | Contractor Safety  |

## APPENDIX D

Source: Data Request 1.32

| New or Revised<br>CR3 Project Management Procedures |   |   |
|---|---|---|
| Procedure<br>Number                                 | Procedure<br>Revision Number<br>/(Date) | Procedure Title                                     |
| ACT-SUBS-00261                                      | Rev 16 (Dec-2009)                       | Phased Project Evaluation and Authorization Process |
| PJM-SUBS-00001                                      | Rev 1 (May-2009)                        | Achieving Excellence in Project Management          |
| PJM-SUBS-00003                                      | Rev 0 (May-2009)                        | Project Scope Management                            |
| PJM-SUBS-00004                                      | Rev 0 (May-2009)                        | Project Time Management                             |
| PJM-SUBS-00005                                      | Rev 0 (July-2009)                       | Project Cost & Financial Management                 |
| PJM-SUBS-00006                                      | Rev 0 (Aug-2009)                        | Project Quality Management                          |
| PJM-SUBS-00007                                      | Rev 1 (May-2009)                        | Project Resource Management                         |
| PJM-SUBS-00008                                      | Rev 0 (Mar-2009)                        | Project Risk Management                             |
| PJM-SUBS-00009                                      | Rev 0 (Jun-2009)                        | Project Communication Management                    |
| PJM-SUBS-00010                                      | Rev 0 (May-2009)                        | Project Procurement Management                      |
| PJM-SUBS-00011                                      | Rev 0 (Nov-2009)                        | Project Environmental Health & Safety Management    |
| PJM-SUBS-00012                                      | Rev 0 (Nov-2009)                        | Project Earned Value Management                     |
| PJM-SUBS-00013                                      | Rev 0 (Sep-2009)                        | Project Lessons Learned Management                  |
| PJM-SUBS-00014                                      | Rev 0 (Aug-2009)                        | Project Claim Management                            |
| PJM-SUBS-00015                                      | Rev 0 (Jul-2009)                        | Project Close Management                            |
| PJM-SUBS-00016                                      | Rev 0 (Jul-2009)                        | Project Manager Training Development Program        |
| ADM-NGGC-0206                                       | Rev 2 (Sep-2009)                        | Managing Fatigue and Working Hour Limits            |

**APPENDIX E**

*Source: Data Request 1.9*

| PEF Risk Assessment Criteria<br>Probability Scales |        |
|--|--------|
| Very Low   | <10%   |
| Low  | 11-33% |
| Moderate   | 34-65% |
| High   | 66-89% |
| Very High  | >89%   |

| PEF Risk Assessment Criteria<br>Impact Scales |            |  |   |   |
|---|------------|--|---|---|
| Category Level                                | Cost       | Schedule   | Quality   | Compliance  |
| Minimal                                       | <2%        | No slip  | No reduction  | Project compliant   |
| Moderate                                      | ≥2 & <5%   | Slip occurs, but has little or no impact to project        | Quality reduced but has little or no impact                   | Local/State/Federal warning or Near Miss                                |
| Significant                                   | ≥5 & <10%  | Slip occurs, and has a significant impact on the project   | Quality reduced and has a significant impact on the project   | Local/State/Federal violation incurred or Recordable/Lost Time Incident |
| Severe  | ≥10 & <15% | Slip occurs, and has a noticeable impact on the enterprise | Quality reduced and has a noticeable impact on the enterprise | Local/State/Federal Stoppage or Fatality                                |
| Critical                                      | ≥15%       | Unacceptable slip occurs                                   | Unacceptable reduction in quality                             | Local/State/Federal Stoppage or Fatality                                |

**APPENDIX F**

*Source: Data Request 1.9*

| CR3 New or Revised<br>Contractor Selection and Management Procedures |                                     |   |
|--|-------------------------------------|---|
| Procedure Number   | Procedure Revision Number<br>(Date) | Procedure Title   |
| CNT-SUBS-0001  | Rev 19 (Jan-2010)                   | Corporate Contracting Process                           |
| MCP-NGGC-0001  | Rev 14 (Mar-2009)                   | NGG Contract Initiation, Development and Administration |
| SAF-SUBS-00041   | Rev 10 (Jun-2009)                   | Contractor Safety                                       |

**APPENDIX G**

*Source: Data Request 1.26*