BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 110009-EI
FLORIDA POWER & LIGHT COMPANY

MAY 2, 2011

IN RE: NUCLEAR POWER PLANT COST RECOVERY
FOR THE YEARS ENDING
DECEMBER 2011 AND 2012

TESTIMONY & EXHIBITS OF:

TERRY O. JONES

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FLORIDA POWER & LIGHT COMPANY

DIRECT TESTIMONY OF TERRY O. JONES

DOCKET NO. 110009-EI

MAY 2, 2011

Q. Please state your name and business address.

My name is Terry O. Jones, and my business address is 700 Universe Boulevard, Juno Beach, FL 33408.

Q. By whom are you employed and what is your position?

A. I am employed with Florida Power & Light Company (FPL) as Vice President, Nuclear Power Uprates.

Q. Have you previously filed testimony in this docket?

A. Yes.

Q. Are you sponsoring any exhibits to this testimony?

A. Yes. I am sponsoring the following exhibits:

- Exhibit TOJ-21 consists of 2011 P Schedules and 2011 TOR Schedules. The NFR Schedules contain a table of contents listing the schedules that are sponsored and co-sponsored by FPL Witness Powers, and me, respectively. FPL has included the 2011 P Schedules as they are the basis for determining the reasonableness of the true-up of FPL's 2011 AE Schedules. The 2011 TOR Schedules present a summary of costs that are the basis for the revenue requirements being recovered in 2011.

- Exhibit TOJ-22 consists of 2011 AE Schedules, 2012 P Schedules, and 2012 TOR Schedules. The NFR Schedules contain a table of contents listing the schedules that are sponsored and co-sponsored by FPL Witness Powers and me, respectively.
- TOJ-23, Extended Power Uprate Project Schedule as of April 2011
- TOJ-24, 2011 Extended Power Uprate Work Activities
- TOJ-25, EPU Actual/Estimated 2011 Summary Cost Tables
- TOJ-26, 2012 Extended Power Uprate Work Activities
- TOJ-27, EPU Projected 2012 Summary Cost Tables

Q. Please describe how your testimony is organized.

A. My testimony includes the following sections:

1. Project Status and Schedule
2. Project Management Internal Controls
3. 2011 Actual/Estimated Construction Activities and Costs
4. 2012 Projected Construction Activities and Costs
5. True-Up to Original Cost and Updated Cost Estimate Range
6. Long Term Feasibility

Q. What is the purpose of your testimony?

A. My testimony presents and explains FPL's Extended Power Uprates (EPU or Uprate) project at its St. Lucie (PSL) and Turkey Point (PTN) power plants, the reasonableness of FPL's 2011 actual/estimated EPU costs, and the reasonableness of FPL's 2012 projected EPU costs. The activities and expenditures for these years are described in separate sections below. My

testimony also presents the True-up to Original Projections for the Uprate project for the years 2008 through 2013, provides an updated total project cost estimate range, and summarizes FPL's updated EPU feasibility analysis, which continues to demonstrate that the project is a cost-effective generation addition for FPL's customers. FPL Witness Dr. Steven R. Sim describes the economic feasibility analysis in detail in his testimony and exhibits.

Q. Would you please provide an overview of the expected benefits of the EPU project for FPL's customers?

A. Yes. Taking into account the updated project information related in this testimony, FPL expects that the EPU project will:

- Provide estimated fuel cost savings for customers of approximately $106 million in the first full year of operation;
- Provide estimated fuel cost savings for FPL's customers over the life of the plants of approximately $4.6 billion (nominal);
- Diversify FPL's fuel sources by decreasing reliance on natural gas by 2% beginning in the first full year of operation;
- Provide a total amount of energy that is equivalent to the usage of approximately 209,500 residential customers;
- Reduce annual fossil fuel usage by the equivalent of 5 million barrels of oil or 29 million mmBTU of natural gas annually; and
- Reduce CO_2 emissions by an estimated 31 million tons over the life of the plants, which is the equivalent of operating FPL's entire generating system with zero CO_2 emissions for 9 months.

These quantifications are set forth in FPL Witness Dr. Sim's testimony and Exhibit SRS-1.

Q. Please summarize your testimony.

A. FPL is working to deliver the substantial benefits of additional nuclear generating capacity to its customers, without expanding the footprint of its existing nuclear generating plants, by performing an extended power uprate of its existing St. Lucie Units 1 & 2 and Turkey Point Units 3 & 4. Upon completion, FPL estimates that approximately 450 megawatts electric power (MWe) of baseload, non-greenhouse gas emitting generation will be provided by the EPU project for its customers, and that customers will realize significant fuel cost savings as a result. In addition, the benefits to FPL's customers from additional nuclear generation will be realized through the EPU project at least a decade earlier than if additional nuclear generation were to be delivered solely through new nuclear units.

The EPU project is of extraordinary managerial and technical difficulty. FPL's EPU project represents one of the largest and most complex nuclear design, engineering and construction projects undertaken in the nuclear industry since the construction of the last generation of U.S. nuclear plants. As of May 2011, FPL estimates that the project will require the orchestration and management of approximately 1 million total hours of design engineering and total EPU project work of approximately 10 million hours. This is the equivalent of approximately 500 person-years of design engineering time and

5,000 person-years of total EPU work time. All of this work is being conducted on four operating nuclear units with live steam, electrical and nuclear fuel equipment and systems. FPL is committed to efficiently managing all of this work in a way that maximizes the benefits of the EPU project for FPL's customers and in a manner than maintains nuclear and industrial safety.

The project team is in the process of performing design engineering, procuring long lead equipment and materials, obtaining regulatory approvals, and implementing plant modifications to support the uprate conditions in multiple refueling outages for each of the nuclear units. This process is supported by robust and overlapping project schedule and cost controls, along with rigorous risk management. Additionally, the EPU team manages the Uprate work in a manner that ensures that only the costs necessary for the Uprates are expended and included in the Nuclear Cost Recovery Clause (NCRC).

As detailed in this testimony and accompanying exhibits, FPL plans to invest a total of approximately $610 million during 2011 and approximately $799 million during 2012 in the Uprate project. FPL also plans to place certain Uprate project systems into service. The estimated equipment in-service amounts for 2011 are approximately $218 million, and for 2012 are approximately $1,186 million. (Please note that the dollar values in my testimony are the forecasted EPU resource requirements, and do not include

certain accounting adjustments made by FPL Witness Powers, unless noted otherwise.) The 2011-2012 EPU project carrying costs on its capital investments, Operations & Maintenance expenses, and revenue requirements for in-service components contribute to a total Company request to recover approximately $196 million in 2012, as described by FPL Witness Powers. This equates to a residential customer monthly bill impact of $2.09 per 1,000 kWh.

FPL has updated its nonbinding total cost estimate range to reflect the progress made on the project and information learned through the beginning of 2011 to approximately $2,324 million to $2,479 million (including transmission and carrying costs) and has utilized the high end of this range as the starting point for an economic feasibility analysis performed consistent with the direction of the Commission. While the current nonbinding cost estimate range is slightly higher than the high-end of the total nonbinding cost estimate range used in the economic analyses conducted last year, the testimony and exhibits of FPL Witness Dr. Sim show that the EPU project continues to result in substantial economic benefits for FPL's customers and continues to be in the best interest of customers to pursue. For example, FPL Witness Dr. Sim's Exhibit SRS-8 shows that in the Medium Fuel Cost, Environmental II cost scenario, the project is currently expected to reduce costs to customers by more than $622 million in cumulative present value of revenue requirements compared to a plan without the EPU project.

FPL's EPU activities, the reasonableness of its 2011 and 2012 costs, and its updated nonbinding cost estimate range and feasibility analysis are described in more detail below.

PROJECT STATUS AND SCHEDULE

Q. Please provide an overview of the current status of the Uprate Project.

A. As described in my March 1, 2011 testimony addressing 2009 and 2010 activities and costs, the EPU is being achieved in four overlapping phases. Those four phases are explained in detail in my March testimony. In 2011, FPL expects to complete the Engineering Analysis Phase. FPL will also continue the Long Lead Procurement, Engineering Design Modification, and Implementation phases of the project to support the planned unit outages in 2011 and 2012. FPL is committed to approximately 95% of its long lead procurement items for the St. Lucie units and approximately 80% of its long lead procurement items for the Turkey Point units. FPL is currently performing the Engineering Design Modification Phase, and has successfully completed two of eight planned EPU outages in the Implementation Phase. FPL has also amended its contract with Bechtel, the Engineering, Procurement & Construction (EPC) vendor, for the St. Lucie scope of work to include a target price, better aligning FPL's and Bechtel's project goals.

Q. Please describe the Federal licensing needed for the EPU Project.

A. FPL must obtain a license amendment to the renewed operating licenses for St. Lucie Unit 1, St. Lucie Unit 2, Turkey Point Unit 3 and Turkey Point Unit 4 in order to operate at the EPU conditions. The Turkey Point EPU License Amendment Request (LAR) was submitted to the Nuclear Regulatory Commission (NRC) in October 2010 and the St. Lucie Unit 1 EPU LAR was resubmitted to the NRC in November 2010, as described in my March testimony addressing 2010 activities and costs. The St. Lucie Unit 2 EPU LAR was submitted to the NRC in February 2011.

The St. Lucie Unit 1 and Turkey Point EPU LARs were accepted for technical review by the NRC on March 9 and 11, 2011, respectively. According to NRC projections, each of these submittals will take approximately 12 months from acceptance for the NRC to review, request additional information, and approve. Also, as a result of the LAR review process, the NRC may require additional modifications or analyses to be performed. EPU project management is monitoring the progress of the NRC LAR reviews and is prepared to address any questions or issues that may arise during the NRC's review.

Q. Please explain the timing of the LAR approvals and their effect on the operation of the uprated units in more detail.

A. Each plant is unique with respect to the effect of the timing of the NRC approvals. At Turkey Point, the units cannot be restarted following their second (final) EPU outage unless the NRC has approved the EPU LAR. At

St. Lucie, the units can be restarted with the EPU modifications completed (with the exception of the instrumentation setpoints and software changes), but would be operated at existing reactor power levels as opposed to the uprated power levels if FPL has not received approval of the St. Lucie Unit EPU LARs. The St. Lucie units would operate at a slightly increased electrical power output due to the more efficient equipment being operated at existing reactor power levels. In such a scenario, after receipt of NRC approvals for the St. Lucie uprates, FPL may be required to modify the instrumentation setpoints during an off-cycle shutdown to enable the plant to operate at the uprate condition.

Q. Are there any remaining Local and/or State permits needed for the EPU Project?

A. No. State and local permitting has been completed for the EPU Projects. Requirements of the revised permits are being implemented.

Q. Please describe the current EPU project schedule.

A. Exhibit TOJ–23, Extended Power Uprate Project Schedule as of April 2011, is the schedule of the EPU Project and the overlapping phases of the work activities presently proposed to take place. This schedule reflects the outage assignment revisions and the outage duration revisions that were discussed in my March 1, 2011 testimony. Additionally, this schedule reflects a 2011 decision to change several of the outage start dates. This project schedule continues to support a project completion date in early 2013.

Q. Please describe the modification installation planning process and the assignment of modifications to particular outages.

A. A critical component to the modification installation planning is the assignment of particular modifications, and the associated construction work, to particular outages and within those outages. This concept was discussed in my March 1, 2011 testimony, and outage assignments continue to be refined. Consideration is given to several aspects of each of the modifications, such as whether the time provided for the engineering of the modification is sufficient to support the needed reviews, approvals, and planning by the unit's outage management; whether the equipment will arrive at the site early enough before the outage to allow for inspections and preparation work prior to installation; whether there is a sufficient labor force to support the amount of work planned; and whether the modification work can be performed in parallel with other work or if it needs to be performed in a series of critical activities.

Q. Did the reassignment of certain modifications to different outages affect FPL's 2011 EPU costs?

A. Yes. As a result of FPL's 2010 outage assignment review, FPL's actual/estimated 2011 costs being presented in this docket are more than what FPL projected its 2011 costs would be last year in Docket No. 100009-EI. FPL moved a significant amount of work planned for St. Lucie in 2010 to 2011, thereby shifting construction costs out of 2010 and into 2011. Additionally, due to this reassignment, the carrying charges for 2011

increased. The revenue requirement computations are sponsored by FPL Witness Powers.

Q. Please explain the benefits of changing outage start dates.

A. The benefits resulting from adjusting outage dates are the maximization of nuclear fuel "burnup" and the minimization of the off-line time of the nuclear units. FPL recently evaluated the need to adjust outage start dates primarily to maximize nuclear fuel burnup and increase the certainty that the EPC vendor will complete the engineering design phase and the first part of the implementation phase – the planning, scheduling, and constructability reviews of modifications – for the successful execution of the implementation performed during each outage. Additionally, project management continues to assess and work with its EPC vendor to ensure it has the right support and resources to complete its work in a timely manner.

Q. Were there any unanticipated schedule changes this year?

A. Yes. The EPU portion of the St. Lucie Unit 2 spring 2011 outage lasted longer than planned, due to an error by Siemens, the vendor who is performing the turbine generator upgrade work.

It was determined that a small tool – an alignment pin – had been left inside the generator stator core by Siemens personnel. When the stator core was tested for performance, the alignment pin caused damage. As a result, the replacement of some of the stator core iron was required to repair the damage caused by the pin, and this work caused the outage to be extended.

Q. Was FPL prudent in the hiring and oversight of Siemens?

A. Yes. Siemens is the Original Equipment Manufacturer and therefore owns all the intellectual property necessary to perform this scope of work. Siemens is highly specialized and has an excellent track record with similar work on other FPL projects. Moreover, it has a robust system of practices and procedures that have resulted in successful projects over the years. FPL contracted with Siemens in 2008, which was subject to the Commission's prudence review of 2008 decisions and costs in 2009.

FPL reviewed and benchmarked Siemens's performance at other locations to validate those practices and procedures, and continues to be diligent in its oversight of Siemens.

Q. Was there any effect on the cost of the project?

A. It is FPL's position that Siemens is required to repair the damage at no cost to FPL, and that is currently being pursued. However, as with any major nuclear outage work contract, there are limits to Siemens's liability, and recovery of replacement generation and fuel costs on FPL's system is not provided for by the contract. Such limitations on liability are industry-standard, and in fact necessary as no vendor would agree to such cost exposure, and such vendors are necessary to perform this type of nuclear outage work. These system costs are not included in FPL's Nuclear Cost Recovery request.

Q. Will the earthquake and tsunami in Japan, and resulting effects on the nuclear power plants there, affect the EPU project?

A. It is too soon to tell whether or how the events in Japan will affect the EPU project. It is likely that those events will have operational, regulatory and political ramifications for the U.S. nuclear industry in general. FPL Witness Dr. Nils Diaz addresses this topic in his May 2, 2011 testimony. It is also possible that the events in Japan will affect the EPU LAR approval process and the total cost of the project if the NRC requires additional analyses or modifications. However, it is not possible to quantify such effects at this time.

PROJECT MANAGEMENT INTERNAL CONTROLS

Q. Please describe the project management internal controls that FPL has in place to ensure that the project is effectively managed.

A. As described in detail in my March 1, 2011 testimony, FPL has robust project planning, management, and execution processes in place. FPL utilizes a variety of mutually reinforcing schedules and cost controls, and draws upon the expertise provided by employees within the project team, employees within the separate Nuclear Business Operations group, and executive management. Those controls continue to be utilized in 2011.

One of the key project management tools utilized by the EPU team is the project Risk Register. Risk matrices, such as EPU's Risk Register, are a common project management tool. The Risk Register allows for identified risks – including potential increases to scope – to be logged and assessed in

terms of cost and probability. Resolutions are also tracked in the Risk Register, which may include avoidance or mitigation of the identified risk, or incorporation of the particular item within the project scope. Periodic presentations are made to executive management where risks, costs, and schedules are discussed.

Q. Have there been any changes in the project management system FPL is using to ensure that the 2011 actual/estimated and 2012 projected costs are reasonable?

A. Yes. The EPU project management processes are adjusted to implement and use industry best practices through self-assessment, peer reviews, independent third party reviews, internal and external audits, and executive oversight and direction. In 2011, FPL made adjustments to controls related to site report generation; staffing ramp levels; work scope assignments, and outage implementation interface.

Q. Are any internal audit activities underway?

A. Yes. The annual internal audit of the EPU financials is currently being conducted, which provides a review of project expenditures through 2010. FPL anticipates that this audit will be completed this summer. An internal audit will be conducted next year to review 2011 expenditures.

2011 ACTUAL/ESTIMATED CONSTRUCTION ACTIVITIES AND COSTS

Q. Please summarize the activity planned for 2011.

A. In 2011, FPL submitted the third and final EPU LAR to the NRC, and has shifted from performing the engineering analyses and developing the LARs to supporting the NRC's review of the LARs. The Long Lead Equipment procurement phase will continue as necessary equipment is delivered to support the outages in 2011 and 2012. The Engineering Design Modification Phase will continue with the EPC vendor preparing modification packages, and performing support activities for outage modifications. The Implementation Phase will continue with the EPC vendor performing implementation activities, the planning and scheduling of EPU outage activities, and the execution of activities during the 2011 outages. There are three EPU outages scheduled to commence in 2011: the St. Lucie Unit 2 outage which will be completed in May 2011, the Turkey Point Unit 4 spring outage which started in March 2011, and the St. Lucie Unit 1 outage which is scheduled to start in November 2011. The return to service from the St. Lucie Unit 2 outage will result in an increase of approximately 20 MWe in the output of the unit due to the installation of a more efficient low pressure turbine rotor during the outage, approximately 17 MWe of which will be for the benefit of FPL's customers. The additional electrical output resulting from more efficient equipment does not require prior NRC license amendment approval.

Q. Did FPL project its 2011 EPU costs for these types of activities in 2010?

A. Yes. FPL prepared and filed a projection of 2011 costs in Docket No. 100009-EI. FPL's previously-projected 2011 costs are provided in Exhibit TOJ-21.

Q. Please describe how FPL developed its projections of 2011 costs for the NFRs submitted in 2010.

A. The 2011 projected costs were developed from Project Controls forecasts derived from the best available information for all known project activities in 2011. Included in the forecasts are the vendor long lead material contracts that have scheduled milestone payments in 2011. Cash flows are based upon the latest fabrication and delivery schedule information. Each major labor related services vendor forecast is based upon the original awarded value and all approved changes. Added to this, where applicable, would be an estimate of any known pending changes to arrive at a best forecast at completion for each vendor. Owner engineering and project management support forecasts are derived from approved detailed staffing plans. Cash flows are developed for each approved position based on the expected assignment duration and expected overtime, where applicable. The large construction related vendor forecasts are based upon previous experience, known scope(s) of work, productivity factors related to outage conditions and prevailing pertinent wage rates. Cash flow projections for items identified in the Risk Register are based upon anticipated engineering, material procurement, and outage implementation time horizons.

Q. Were FPL's projected 2011 costs reasonable?

A. Yes. Careful vendor oversight, use of competitive bidding when appropriate, and the application of the robust internal schedule and cost controls and internal management processes all helped ensure that FPL's projected 2011 expenditures were reasonable.

Q. Has FPL trued up these projections to develop 2011 Actual/Estimated costs?

A. Yes. Exhibit TOJ-22 presents FPL's 2011 Actual/Estimated costs.

Q. Please describe how FPL developed its 2011 Actual/Estimated costs.

A. On a monthly basis, a detailed project cost review is held, in which project management reviews actual and estimated costs. Each major category is examined and, where applicable, performance measurement tools are analyzed. Schedule Performance Index (SPI) and Cost Performance Index (CPI) tools are used along with Earned Value Progress Measurement reporting as appropriate.

The 2011 actual/estimated costs were developed from Project Controls forecasts as described above.

Actual 2011 costs come from a monthly download of project charges from the FPL accounting system. These charges are for materials and services from multiple vendors and are applied to the total project cost on an ongoing basis. Each charge is applied using a coding structure which defines which of the

units the charges apply to. For project management purposes, the charges are subsequently broken down by major vendor or appropriate cost control grouping which ultimately supports project management analysis and forecasting.

Q. What types of costs does FPL plan to incur for the Uprate Project in 2011?

A. Schedule AE-6 of Exhibit TOJ-22 breaks the 2011 actual/estimated total costs of $569,779,321 down into the following categories: License Application $19,797,804; Engineering and Design $20,251,942; Permitting $45,451; Project Management $33,835,035; Power Block Engineering, Procurement, Etc. $489,873,573; and Non-Power Block Engineering, Procurement, Etc. $5,975,515. Exhibit TOJ-25, EPU Actual/Estimated 2011 Costs Tables, includes 9 tables summarizing the EPU Project 2011 Actual/Estimated (A/E) costs by NFR category which includes post in-service amounts.

Q. Please describe the 2011 activities in the License Application category.

A. For the period ending December 31, 2011, License Application costs are estimated to be $19,797,804 as shown on Line 3 of Schedule AE-6 of Exhibit TOJ-22. These license application costs consist primarily of payments to vendors for the preparation of the PSL Unit 2 LAR, responding to the NRC Requests for Additional Information (RAIs) as necessary in 2011, and NRC fees. This was approximately $9.4 million more than projected due to increased scope and a longer duration for completing the licensing effort.

Q. Please describe the 2011 activities in the Engineering and Design category.

A. For the period ending December 31, 2011, Engineering and Design costs are estimated to be $20,251,942 as shown on Line 4 of Schedule AE-6 of Exhibit TOJ-22. This amount consists primarily of FPL's engineering and design work in support of review and approval of the engineered design modification packages prepared for the St. Lucie and Turkey Point sites by Bechtel, FPL's EPC vendor on the EPUs. This was approximately $11 million more than projected due to the need for additional resources to support the increased scope for design engineering.

Q. Please describe the 2011 activities in the Permitting category.

A. For the period ending December 31, 2011, Permitting costs are estimated to be $45,451 as shown on Line 5 of Schedule AE-6 of Exhibit TOJ-22. This amount consists primarily of environmental studies and application preparation and submittal to modify the PSL discharge permit. This is approximately $105,000 less than projected due to the completion of the permitting efforts. This amount does not include required permit compliance ordered stipulations, which include monitoring and reporting.

Q. Please describe the 2011 activities in the Project Management category and how those activities help ensure that the Uprate Project will be completed on a reasonable schedule and at a reasonable cost.

A. For the period ending December 31, 2011, Project Management costs are estimated to be $33,835,035 as shown on Line 6 of Schedule AE-6 of Exhibit

TOJ-22. This category includes FPL and contractor management personnel at each of the sites and those in the Juno Beach Office. This work and the associated costs are required to ensure the uprate project is managed in an efficient and cost-effective manner. This is approximately $9.9 million more than projected due to additional support needed for the implementation of the three EPU outages scheduled for 2011.

Q. Please describe the 2011 activities in the Power Block Engineering, Procurement, Etc. category.

A. For the period ending December 31, 2011, Power Block Engineering and Procurement costs are estimated to be $489,873,573 as shown on Line 9 of Schedule AE-6 of Exhibit TOJ-22. This amount is primarily for the development of the engineering design modification packages and for the implementation of the scheduled work for the three outages scheduled for 2011. This work includes preparation of the modification packages (part of the Engineering Design Modification Phase); the development of directions for the removal, replacement and/or modification of components, equipment, systems and structures as needed to support the uprate condition, and the performance of field walkdowns by Bechtel. This also includes certain implementation activities, including the preparation of work orders for implementation and integration of modifications into the unit outage schedule. The second part of this phase is the physical execution of the work, some of which will occur in the three scheduled 2011 outages.

Some modifications can be performed when the units are operating, reducing the complexity of the outage and limiting the outage duration. FPL evaluates the risk to the continued operation of the unit and if determined to be an acceptable risk, the modifications will be performed while the unit is on line. One such modification is the modification of the Turkey Point turbine gantry crane. Modifications to the crane are necessary for increased capacity and efficiency in removing and installing, with precise movements, many pieces of heavy equipment. The needed modifications to this crane will be performed while the respective unit is operating thus saving plant outage time.

Procurement costs include the purchase of long lead equipment items and progress payments to manufacturing vendors. FPL is continuing to execute on contracts for the procurement of major pieces of equipment which include steam turbines, main generator rotors, pumps, motors, valves, and heat exchangers of various specifications. This is approximately $1.4 million less than projected due to scope being deferred to the second PSL1 EPU outage to be completed in 2012.

Q. Please describe the 2011 activities in the Non-Power Block Engineering, Procurement, Etc. category.

A. For the period ending December 31, 2011, Non-Power Block Engineering costs are estimated to be $5,975,515 as shown on Line 10 of Schedule AE-6 of Exhibit TOJ-22. This category consists primarily of the following:

engineering, permitting, and construction of temporary facilities; upgrades to training simulators; and additional dry cask storage for spent fuel.

A fabrication area used to pre-fabricate piping and valves reduces the outage time because work can be performed prior to the outage and at the same time as other work, instead of in a series sequence of field activities during the outage. A warehouse is used to store and stage delivered materials for the EPU project prior to installation and to provide an area for the training and qualification of craft labor. A site training and qualification area is necessary to ensure Turkey Point has the needed qualified craft labor support to perform the many tasks needed to remove, install or modify plant equipment.

This category also includes the modifications to each site's operator training simulators. The training simulators require modifications to reflect the equipment and operating parameters in the uprate condition. Additionally, this category includes costs associated with increased scope for six dry cask storage containers, which scope was added to the project in December 2010. This category of costs is approximately $1.1 million more than projected, primarily due to the addition of the dry cask storage containers.

Q. Please describe the 2011 activities in the Transmission category.

A For the period ending December 31, 2011, Transmission costs are estimated to be $18,066,007 as shown on Line 34 of Schedule AE-6 of Exhibit TOJ-22. This amount is primarily related to costs associated with the upgrades to the

main transformers and plant yard electrical components at the sites. This is approximately $10.2 million more than projected due to the purchase of the transformers with some transmission outage work accelerated and some deferred due to line and switchyard availability.

Q. Please describe the 2011 actual/estimated recoverable O&M costs.

A. Actual/Estimated recoverable O&M costs for the EPU project in 2011 include $12,701,007 for EPU, shown on Line 19 of Schedule AE-4 of Exhibit TOJ-22, and $5,909 for Transmission, as shown on Line 28 of Schedule P-4 of Exhibit TOJ-22. Recoverable O&M primarily consists of costs for performing inspections of the 1 through 4 feedwater heaters at PSL Unit 2 and PTN Unit 4 and an estimate of obsolete materials that will be expensed as a result of modifications completed in 2011. Additionally, costs for commodities that do not meet FPL's capitalization policy are included. This is approximately $8.6 million more due to an increased scope of required equipment inspections which do not meet capitalization criteria.

Q. Please describe the equipment going into service in 2011.

A. Exhibit TOJ-24, 2011 Extended Power Uprate Work Activities, is a listing by outage of major 2011 work activities for PSL Unit 1, PSL Unit 2 and PTN Unit 4. To the extent the work activities are subject to capitalization as units of property and the modification is completed in 2011, the plant components will be placed into service. The items going into service include, but are not limited to, feedwater heater drain valves, main generators, and isophase bus duct modifications. Certain Transmission and Distribution equipment will

also be placed in service in 2011 which includes a main transformer and main transformer cooler upgrades.

Q. Are the 2011 actual/estimated costs presented in your testimony "separate and apart" from other nuclear plant expenditures?

A. Yes, the 2011 actual/estimated costs presented are "separate and apart" from other nuclear plant expenditures. The construction costs and associated carrying charges and recoverable O&M expenses for which FPL is requesting recovery through this proceeding were caused only by activities necessary for the EPU, and would not have been incurred otherwise. As explained in my testimony submitted in this docket on March 1, 2011, FPL's identification of the major components that must be modified or replaced to enable the units to function properly and reliably in the uprated condition is based on engineering analyses. A review of historical site planning documents and the License Renewal Action Items compiled in conjunction with the NRC's approval of FPL's requested license renewals confirmed that the uprate costs were "separate and apart" from other planned nuclear activities and expenditures. FPL has continued to carefully follow all of the safeguards in this respect, which the Commission has previously reviewed and found to be reasonable and appropriate.

Q. Are FPL's actual/estimated 2011 EPU costs reasonable?

A. Yes. The majority of FPL's 2011 expenditures are for (i) payments to long lead equipment manufacturers pursuant to competitively bid contracts; (ii) payments to the competitively bid EPC vendor; (iii) payments to original

equipment manufacturers for LAR engineering analyses; and (iv) the implementation costs associated with three EPU outages.

Careful vendor oversight, continued use of competitive bidding when appropriate, and the application of the robust internal schedule and cost controls and internal management processes all support a finding that FPL's actual/estimated 2011 expenditures are reasonable.

2012 PROJECTED CONSTRUCTION ACTIVITIES AND COSTS

Q. Please summarize the construction activities projected for 2012.

A. In 2012, for the EPU LAR Engineering Analysis phase, FPL will continue to support the NRC review process, including, responding to NRC RAIs and interfacing with the NRC Staff. The Long Lead Equipment Procurement Phase will be completed, including equipment for the modifications in the 2012 outages. The Engineering Design Modification Phase will continue with modification package preparation for the final EPU outages in 2012. Implementation will be worked for each of the three outages in 2012: the PTN Unit 3 and PSL Unit 2 spring outages, and the PTN Unit 4 fall outage. Each outage requires long lead equipment, planning, schedule integration, and the actual execution of the physical work in the plants, including extensive testing and systematic turnover to operations. Exhibit TOJ-26, 2012 Extended Power

Uprate Work Activities, includes the unit outage, the work activity, and a description of why it is necessary for the EPU Project.

Q. Please describe how FPL developed its projections of 2012 costs for its NFRs?

A. The 2012 projected costs were developed from Project Controls forecasts as described above.

Q. What types of costs does FPL project to incur for the Uprate Project in 2012?

A. Schedule P-6 of Exhibit TOJ-22 breaks the 2012 projected total costs of $708,960,295 down into the following categories: License Application $5,312,846; Engineering and Design $11,091,593; Permitting $0; Project Management $26,330,854; and Power Block Engineering, Procurement, Etc. $665,777,875; and Non-Power Block Engineering, Procurement, Etc. $447,127. Exhibit TOJ-27, EPU Project 2012 Projected Costs Tables, provides a summary of the projected EPU Project costs for the NFR categories which includes post in-service amounts.

Q. Please describe the activities in the License Application category for 2012.

A. For the period ending December 31, 2012, License Application costs are projected to be $5,312,846 as shown on Line 3 of Schedule P-6 of Exhibit TOJ-22. These amounts consist primarily of vendor payments necessary for responding to NRC RAIs, FPL support and interface with NRC staff, and NRC review fees.

Q. Please describe the activities in the Engineering and Design category.

A. For the period ending December 31, 2012, Engineering and Design costs are projected to be $11,091,593 as shown on Line 4 of Schedule P-6 of Exhibit TOJ-22. The amounts consist primarily of FPL engineering activities in support of the review and approval of the engineered modification packages.

Q. Please describe the activities in the Project Management category and how those activities help to ensure that the Uprate Project will be completed on a reasonable schedule and at a reasonable cost.

A. For the period ending December 31, 2012, Project Management costs are projected to be $26,330,854 as shown on Line 6 of Schedule P-6 of Exhibit TOJ-22. This category includes the project management costs associated with the oversight and management of the engineering of modification packages, and implementation of modifications during the planned outages at PSL Unit 2, PTN Unit 3, and PTN Unit 4 occurring in 2012. This work and the associated costs are required to ensure the uprate project is managed in a safe, efficient, and cost-effective manner.

Q. Please describe the 2012 activities in the Power Block Engineering, Procurement, Etc. category.

A. For the period ending December 31, 2012, Power Block Engineering and Procurement costs are projected to be $665,777,875, as shown on Line 9 of Schedule P-6 of Exhibit TOJ-22. This amount consists of milestone payments made to manufacturers of long lead materials and payments made to the EPC vendor for the vast work associated with the implementation of the engineered modification packages in the three planned 2012 outages. This includes final

known payments to vendors following installation and testing of the equipment supplied for the Uprates completed through 2012.

The St. Lucie Unit 2 spring 2012 outage is the second of the two planned EPU outages for the unit. Some of the modifications planned for the spring 2012 outage are: condensate pump replacement, High Pressure turbine rotor replacement, feedwater heater 5A and 5B replacement, feedwater heater drain pumps and valves replacements, and Moisture Separator Reheater (MSR) replacements.

The Turkey Point Unit 3 spring 2012 outage is the second of the two planned EPU outages for the unit. Some of the modifications planned for the 2012 outage are: main turbine upgrades, main generator rewind, MSR replacements, main condenser replacement, condensate pumps and motors replacements, and replacement of feedwater heaters 5A and B and 6A and B.

The Turkey Point Unit 4 fall 2012 outage is the second of the two EPU outages planned for the unit. Some of the modifications planned for the fall 2012 outage are: main turbine upgrades, main generator rewind, MSR replacements, main condenser replacement, condensate pumps and motors replacements, and replacement of feedwater heaters 5A and B and 6A and B, and feedwater heater 5 drain piping upgrade.

Q. Please describe the activities in the Non-Power Block Engineering, Procurement, Etc. category.

A. For the period ending December 31, 2012, Non-Power Block Engineering costs are estimated to be $447,127 as shown on Line 10 of Schedule P-6 of Exhibit TOJ-22. This category consists primarily of costs for simulator upgrades and temporary facilities needed to support the project.

Q. Please describe the 2012 activities in the Transmission category.

A. For the period ending December 31, 2012, Transmission costs are projected to be $27,238,132 as shown on Line 34 of Schedule P-6 of Exhibit TOJ-22. This amount is required primarily for the following: Replacement of transformers, transformer cooler upgrades, switchyard breaker replacement with higher capacity breakers, and line and breaker monitoring equipment.

Q. Please describe the 2012 projected recoverable O&M costs.

A. Projected recoverable O&M costs for the EPU project in 2012 total $5,611,503 as shown on Line 19 of schedule P-4 of Exhibit TOJ-22. Recoverable O&M primarily consists of costs for performing equipment inspections and an estimate of obsolete materials that will be expensed as a result of modifications completed in 2012. Additionally, commodities and consumables that do not meet FPL's capitalization policy are included.

Q. Please describe the items going into service in 2012.

A. Exhibit TOJ-26, Extended Power Uprate Work Activities for 2012, is a listing of equipment and control devices that are planned for installation; many of which are planned to be placed into service in 2012. This extensive list

includes the Transmission upgraded items and items such as the main generator rotors, high pressure turbine rotors, main transformers and cooler modifications, feedwater heaters, condensate pumps, and main condensers, among others.

Q. Are the 2012 cost projections presented in your testimony "separate and apart" from other nuclear plant expenditures?

A. Yes. The 2012 cost projections presented are "separate and apart" from other nuclear plant expenditures. As explained in my testimony submitted in this docket on March 1, 2011, FPL's identification of the major components that must be modified or replaced to enable the units to function properly and reliably in the uprated condition is based on engineering analyses. A review of historical site planning documents and the License Renewal Action Items compiled in conjunction with the NRC's approval of FPL's requested license renewals confirmed that the uprate costs were "separate and apart" from other planned nuclear activities and expenditures. FPL has continued to carefully follow all of the safeguards in this respect, which the Commission has previously reviewed and found to be reasonable and appropriate.

Q. Are FPL's projected 2012 EPU costs reasonable?

A. Yes. FPL's projected 2012 costs reflect the significant amount of implementation work that is planned to occur in that year and the large number of systems going into service, as the project nears completion. Project staffing levels, including vendor staffing, will be higher to support the modification package engineering design, implementation, and outage

support. The majority of FPL's costs, however, will continue to flow from the many ongoing contracts introduced and reviewed in prior proceedings. Careful vendor oversight, continued use of competitive bidding when appropriate, and the application of the robust internal schedule and cost controls and internal management processes, all demonstrate that FPL's projected 2012 expenditures are reasonable.

TRUE-UP TO ORIGINAL COST AND UPDATED COST ESTIMATE RANGE

Q. Did FPL prepare a true-up of the total project costs in 2010?

A. Yes. FPL's 2010 True-up to Original schedule is included in TOJ-22.

Q. Have you prepared a current true-up of the total project costs through the current reporting period?

A. Yes. Exhibit TOJ-22 includes the 2012 TOR schedules that compare the current projections to FPL's originally filed Project costs. The 2012 TOR schedules provide information on the project costs through the end of 2013. The 2012 TOR schedules provide the best information currently available for the cost recovery period through 2013.

Q. Has FPL updated its total nonbinding cost forecast for the project?

A. Yes. Pursuant to the Commission's direction in Order No. PSC-09-0783-FOF-EI, FPL has updated its capital cost forecast. FPL has developed an updated cost forecast range for the EPU project that reflects increased scope that is necessary to support NRC regulatory requirements, power generation in

the uprate condition, and implementation support. The updated cost estimate range is approximately $2,324 million to $2,479 million, including transmission costs and carrying costs, as shown on NFR Schedule TOR-2.

Q. Why is FPL providing a nonbinding range instead of a single point estimate?

A. The progression of project activities over the last several years provides FPL with additional insight to revise its nonbinding cost forecast. However, the project is still in the design engineering phase and there remains an expected level of uncertainty with respect to project scope. Accordingly, it is only appropriate to provide the total project cost in terms of a range.

This approach is consistent with generally accepted project management best practices. For example, the Project Management Institute's "A Guide to the Project Management Body of Knowledge" states the following at page 161:

> The accuracy of a project estimate will increase as the project progresses through the project life cycle. For example, a project in the initiation phase could have a rough order of magnitude (ROM) estimate in the range of -50% to +100%. Later in the project, as more information is known, estimates could narrow to a range of -10% to +15%.

As activities such as final design engineering analyses, associated NRC reviews, and construction planning progress, FPL will be able to provide additional certainty to the total project cost forecast.

Q. Please describe the development of the current non-binding cost estimate range for the EPU Project.

A. The low end of the non-binding cost estimate range represents the current forecast, approximately $2.324 million, at this stage of the project based on the following status of tasks: i) the completion of the LAR engineering effort; ii) the approximately 95% committed costs for long lead equipment, which represents approximately $250 million of $510 million of these costs (as of March 2011); iii) the approximately 50% completion of the design modification phase of the project, which represents approximately 625,000 hours of 940,000 hours of this phase (as of April 2011); and iv) an estimate of implementation costs. The LAR analyses and design modification engineering activities have added work scope to the project. The high end of the range reflects the current forecast, an evaluation of the existing trends for weighted risks, and undefined scope. This resulted in a high end non-binding cost estimate range amount of approximately $2,479 million.

Q. Please compare the current cost estimate range of the EPU Project to the nonbinding cost estimate presented in FPL's Need Filing.

A. FPL's need filing in September 2007 for the EPU Project included a nonbinding cost estimate of $1,798 million. This initiation phase estimate was based on FPL's preliminary feasibility and scoping studies and reflected the best information available at that time. (Please note that FPL's original non-binding cost estimate included the participant's share of St. Lucie Unit 2.)

Q. Please describe the primary reasons why the current nonbinding cost estimate range is higher than the nonbinding cost estimate previously provided.

A. The major reason for the higher cost estimate is the increase in project scope that can be categorized into three areas: Regulatory and Safety Margin, Power Generation, and Implementation Support. For example, in the Regulatory and Safety Margin area, the applicant must demonstrate through engineering analyses submitted to the NRC that the increased operating conditions meet regulatory safety criteria. In many instances, in performing the LAR engineering analyses, the need for a modification to a system, structure, or component to obtain acceptable results was identified. As more modifications are identified by the NRC LAR review process, costs for labor and non-labor resources increase.

With respect to Power Generation, modification design engineering has identified additional scope that is required for the units to operate in the power uprate conditions. For example, the replacement of the main steam isolation valve assemblies and the heater drain pressure re-rate could only be identified through design engineering.

Additionally, increases in Implementation Support costs reflect increased project complexity. The EPC vendor is responsible for detailed design of the modifications, procurement of components, and the implementation of modifications. As described above, the EPC vendor, Bechtel, is performing the modification design engineering process and estimating the additional resources required for planning and implementation. These reviews indicate

that modification implementation will be more complex than originally anticipated. This complexity is primarily related to the following:

- Structural Integrity
- Limited Work and Staging Space
- Rigging of Equipment
- Operating Plant Environment
- Work Order Planning and Integration with Routine Outage Activities

Q. Please describe how these components impact projected costs.

A. Structural integrity refers to the existing structures, secondary plant floor elevations and their ability to accommodate heavier and/or larger pieces of equipment supported from the existing structure. Detailed engineering evaluations of the structures are required to support removal, transport and placement of the equipment. Such detailed engineering evaluations had not been performed at the time that the initial non-binding cost estimate was developed. The two components of the additional costs are the engineering analyses needed to assess structural integrity and the resultant plant modifications.

In regards to limited work and staging space, the secondary plant equipment being modified for the EPU Project is located on all of the floors of the secondary plant which includes below grade areas with minimal space for removal, replacement, or modification work. Typically, the modification or replacement of a piece of equipment during a normal refueling outage can be

accomplished while routine work is scheduled to minimize interference with a planned major modification. The EPU Project replaces or modifies numerous major pieces of equipment during a single refueling outage. This work increases the complexity, planning, scheduling, and duration of the outage. EPU modification engineering, work order planning and scheduling activities are integrated with routine outage activities to optimize outage performance. The two components of the additional costs are the engineering analyses needed to assess the limited work and staging space and the resultant plant modifications.

In regards to rigging of equipment, some of the equipment being replaced or modified weighs up to approximately 185 tons. This equipment must be stored, staged, and carefully moved into proper location with precise execution. These heavy lifts, including moving existing equipment out of the way to allow new equipment to be installed, requires individual detailed rigging plans. A rigging plan defines the lifting devices to be used, where the equipment can be landed, and the safe load path for moving the equipment. These rigging plans are then integrated into the work orders and the schedule for crane usage, space, and qualified craft labor availability. The additional costs are associated with the engineering analyses, the additional planning, and implementation of resultant engineered lifts.

In regards to operating plant environment, performing work at an operating plant requires strict adherence to federal, state, and local regulations including industrial safety practices, nuclear safety practices, security requirements, and plant technical specifications. All of these requirements are considered and factored into the integrated planning and scheduling when working in an operating plant environment, and result in additional planning and implementation costs.

Work order planning and integration with routine outage activities is particularly challenging. Planned modifications are assigned to an outage to accomplish the work in a prescribed sequence of removing, installing, or modifying the equipment in preparation for operation in the uprate condition. Once the design engineering modification packages are completed, work orders delineating a step-by-step process for performing the work are prepared. The work orders may include equipment clearance orders to ensure equipment is isolated from mechanical energy and electrically de-energized, confined space entry permits requiring additional safety personnel, and hot work permits which may require a fire watch for grinding and welding activities for equipment being removed, installed or modified. These activities are then integrated into the outage schedule for proper sequencing in a manner that maintains the plant in a safely shutdown condition while accomplishing the needed modifications. Schedule integration includes when and what equipment will be moved by the cranes, where equipment will be

staged for supporting the work activity, when a confined space can be entered safely, and ensuring regulations are met. All of these requirements are considered and factored into the integrated planning, scheduling, and implementation of outages, resulting in additional costs.

LONG TERM FEASIBILITY

Q. What total project cost did FPL use for purposes of the economic feasibility analysis?

A. FPL performed its feasibility analysis with an estimated going forward project cost figure of $1,780 million, which includes transmission and carrying costs. Thus, FPL conservatively assumed the high end of its current nonbinding cost estimate range in order to evaluate project feasibility. Pursuant to Order No. PSC-09-0783-FOF-EI, the amount used accounts for sunk costs.

Q. What assumed megawatt output did FPL use for purposes of the economic feasibility analysis?

A. FPL assumed that the Uprate would provide an additional 450 MWe for feasibility analysis purposes – more than the 399 MWe assumed during the need determination process. The best case scenario for FPL's customers would be an increase in output of approximately 463 MWe. However, it remains to be seen whether the target steam parameters supporting such output will be achieved at each unit. Accordingly, FPL used 450 MWe in its

feasibility analysis, in order to provide feasibility results that are conservative and not reliant upon this best case scenario.

Q. Please summarize the results of the EPU economic feasibility analysis.

A. As discussed in detail by FPL Witness Dr. Sim, the most current feasibility analysis affirms the cost-effectiveness and benefits associated with the Uprate project.

Q. Has FPL examined other aspects of project feasibility?

A. Yes. FPL continuously assesses the financial, technical, and regulatory aspects of the EPU project, and the project remains feasible at this time. This assessment is reflected in the numerous reports and tracking tools used by the project.

Q. Is it technically feasible to accomplish the Uprate Project?

A. Yes. The Project remains technically feasible. The LAR engineering analyses revealed challenges to the Uprates, but the challenges are being addressed. Further, Bechtel has demonstrated that it is capable of performing both the necessary engineering design and implementation scope of work.

Q. Is it feasible to finance the Uprate Project?

A. Yes. The Uprate Project is financed by the general capital FPL raises each year, and FPL's finance department expects that adequate amounts of capital will be obtained to complete the project.

Q. Is it feasible to obtain all necessary licenses and permits?

A. Yes. As described above, FPL has completed the state licensing/permitting process. FPL also has submitted all necessary LARs to the NRC, and expects

that they will be approved. Timing consideration related to these approvals were discussed previously in this testimony.

Q. Are there other aspects to feasibility that FPL has examined?

A. Yes. Inherent to the project management process is the recognition of factors such as resource availability/constraints, potential cost escalations, and industry-critical events such as the cancellation of the Yucca Mountain spent fuel disposal project and the recent events in Japan following the March 2011 earthquake and tsunami. FPL monitors these and other factors. None of these issues has caused the project to cease being feasible.

Q. Are these items required to be included in the feasibility analysis set forth in Rule 25-6.0423(c)5, F.A.C.?

A. No. FPL's economic feasibility analysis sponsored by Witness Dr. Sim is being provided in satisfaction of Rule 25-6.0423(c)5, F.A.C. On February 4, 2010, Commission Staff requested that FPL address these feasibility-related topics. Accordingly, FPL has summarized its assessment of the non-economic topics related to feasibility in response to Staff's request.

Q. Does this conclude your testimony?

A. Yes.

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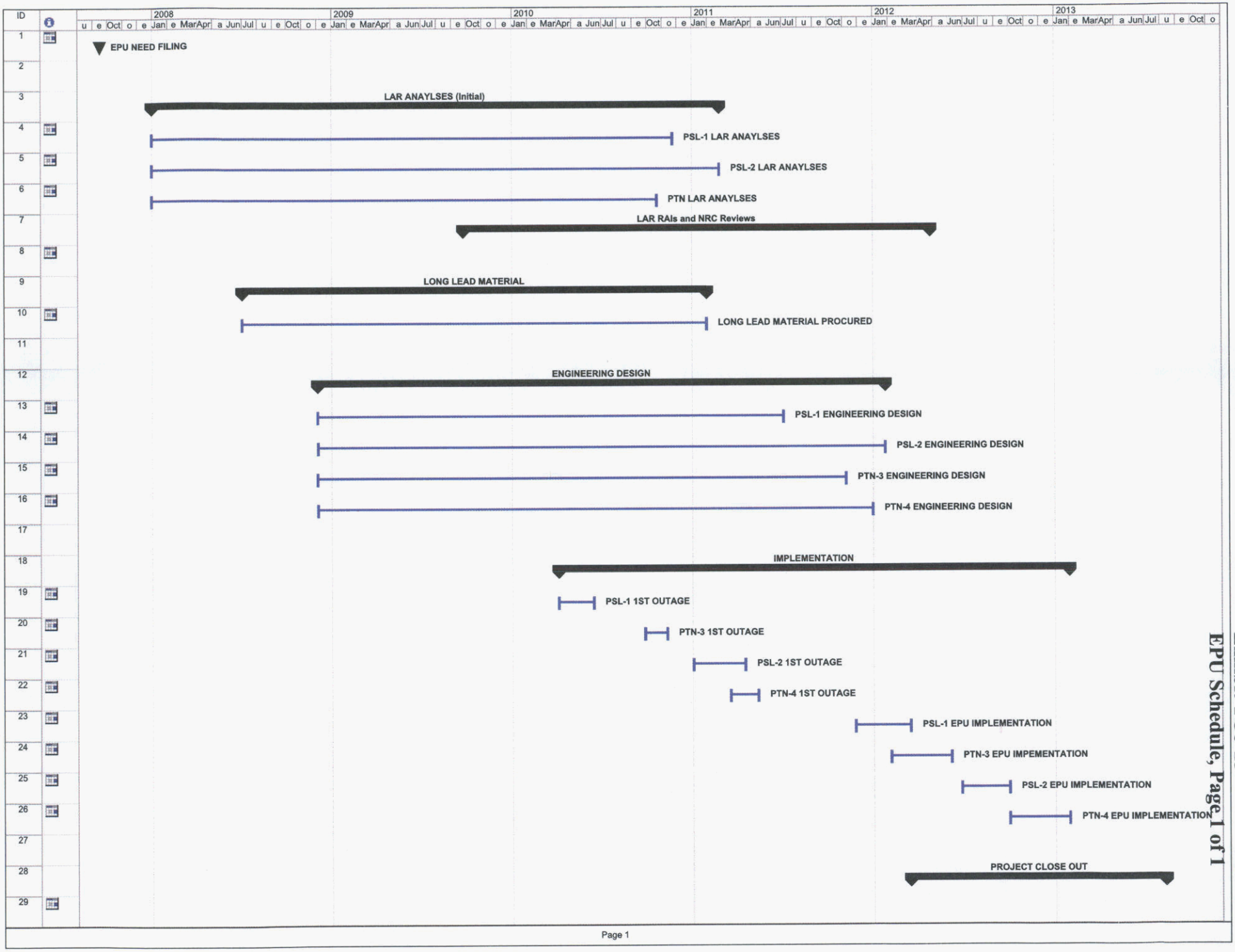

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2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 2 Spring 2011 Outage	Description	Contract	Scoping Document
Condensate Pump Replacement	Larger condensate pumps are needed to pump the increased condensate flows in the uprate conditions	Flowserve PO-130160	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, Balance of Plant (BOP), EPU, Scoping Study, February 2008
Main Generator Exciter Coolers/Blower	Increased cooling of the main generator exciter is required in the power uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Feedwater Heater/ Drain Cooler Tube Inspections	Perform inspections to determine needed modifications for the uprate conditions	Bechtel PO-117820	BOP analysis of component capabilities in the power uprate conditions
Feedwater Heater Nozzle Inspections	Perform inspections to determine needed modifications for the uprate conditions	Bechtel PO-117820	BOP analysis of component capabilities in the power uprate conditions
Main Generator Current Transformers (CT) and Bushing Replacement	Modifications required due to the modifications to the generator rotor and stator for uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Generator Environmental Structure	Required for provision of controlled environment to conduct Stator rewind in situ	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Generator Hydrogen Seal Oil Pressure Increase	Increased hydrogen pressure for main generator cooling is required in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Generator Hydrogen Coolers	Increased main generator cooling is required in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 2 Spring 2011 Outage	Description	Contract	Scoping Document
Generator Loop Test Trailer	Test is to determine defects in the core that may be exacerbated under EPU conditions	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Generator Rotor Replacement and Stator Rewind	Larger generator is needed to increase electrical output in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Low Pressure (LP) Turbine Rotor	Larger LP turbine rotors are required for the increased steam flow in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Transformer Replacement Unit 2	Larger main transformers are needed to handle the increase in the main generator electrical output	Siemens PO-4500467077	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Control Element Drive Mechanism (CEDM) System Modifications	Modify the CEDM system to recover operational and safety margins in the uprate conditions	Westinghouse PO-118271	OEM Recommendation
Turbine Lube Oil Lift Pump Motor Replacement	Increased weight of LP Turbines requires increased motor High Pressure (HP)	Bechtel PO-117820	BOP analysis of component capabilities in the power uprate conditions
Loop Test Trailer	Provide trailer mounted generators to provide loop test current for Generator stator rewind	Bechtel PO-117820	OEM recommendation to conduct in-situ stator rewind testing

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 2 Spring 2011 Outage	Description	Contract	Scoping Document
Transmission and Substation modifications	Implement meter and relaying modifications at St. Lucie and replace switches in the St. Lucie switchyard At the Midway switchyard, #1, #2, #3 increase ampacity, replace switches, and fiber optic protection	T&D	Facilities Study, FPL EPU project, St. Lucie 1&2, Q114 & Q115, March 2009

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 Fall 2011 Outage	Description	Contract	Scoping Document
Condenser Material Modifications includes air removal	Strengthening of the Main Condenser is needed with higher steam and condensate flows in the uprate conditions	BPC PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Containment Mini-Purge	Reduction of maximum allowed Containment pressure per NRC Plant Technical Specifications	Bechtel PO-117820	PSL License Amendment Request (LAR) Engineering
Feedwater Digital Modifications	Instrumentation to provide control the feedwater heater control and dump valves in the uprate conditions	Feedforward SC2287468	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Leading Edge Flow Meter (LEFM) Measurement Uncertainty Recapture (MUR)	Precision flow measurement instrument and instrumentation provides for increased certainty of operating parameters supporting uprate conditions	Cameron PO-116107	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Digital Electro-Hydraulic Computer System Modification	Modifications needed for increased certainty of turbine operating parameters supporting uprate conditions	Westinghouse Power PO-131940	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Electrical Bus Margin Modifications	Required to restore margin on electrical busses as a result of uprate	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 Fall 2011 Outage	Description	Contract	Scoping Document
Piping Vibration Modifications	Increases in steam and feedwater flows may cause piping vibrations. Restraints dampen the vibrations	Bechtel PO-117820	BOP analysis of component capabilities in the power uprate conditions
Main Generator Exciter Coolers/Blower	Increased cooling of the main generator exciter is required in the power uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Feedwater Heater Replacement (#5)	Larger feedwater heaters are needed to process the steam and feedwater flows in the uprate conditions	TEI PO-118224	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Feedwater Regulating Valves Modification	Larger operating mechanisms are required to operate the feedwater regulating valves in the increased uprate conditions	Fisher Controls SC2262515	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Generator CT and Bushing Replacement	Modifications required due to the modifications to the generator rotor and stator for uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Generator Hydrogen Seal Oil Pressure Increase	Increased hydrogen pressure for main generator cooling is required in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Generator Core Iron Replacement	Replace core iron to make the generator stator increased electrical output acceptable in the uprate conditions	Siemens	Testing of the main generator

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 Fall 2011 Outage	Description	Contract	Scoping Document
Main Generator Hydrogen Coolers	Increased main generator cooling is required in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Generator Rotor Replacement and Stator Rewind	Larger generator is needed to increase electrical output in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Moisture Separator Drain Control Valves Replacement	Larger valves are needed for the increased condensed water flow in the uprate conditions	Fisher Controls SC2262201	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Heater Drain Control Valves	Larger valves are needed to control the condensate flow in the uprate conditions	Fisher Controls SC2262201	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Feedwater Heater Drains/ Moisture Separator Reheater (MSR) Digital Controls	Reduce the operating band to optimize efficiency and maximize output	Bechtel PO-117820	St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Heater Drain Pumps and Motors Replacements	Larger pumps and motors are required to pump the increased heater drain flows in the uprate conditions	Flowserve Corp. PO- 125454	St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Hot Leg Injection Flow Improvements	Increasing required flow under EPU and eliminating SPV with cross train power on in-series valves	Bechtel PO-117820	EPU LAR Engineering
HP Turbine Rotor	Larger inlet valves are required for increased steam flows in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, Balance of Plant, EPU, Scoping Study, February 2008

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 Fall 2011 Outage	Description	Contract	Scoping Document
Isophase Bus Duct Cooling	Increased cooling is needed for the electrical connections from the main generator to the main transformer in the uprate conditions	AZZ Calvert PO-120769	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
LP Turbine Rotor	Larger LP turbine rotors are required for the increased steam flow in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Feedwater Pump Replacement	Larger pumps are required to pump the increased feedwater flow required in the uprate conditions	Flowserve PO-121985	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Steam Isolation Valve (MSIV) Modification	Larger operators on the MSIVs are required to operate against higher steam pressure	Enertech for Actuators Valve Parts TBD	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Transformer Cooler Modification	Increased cooling is needed to handle the increase in the main generator electrical output	ABB PO-112255, 126248	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008, ABB Engineering Thermal Loading Design Study, FPL St. Lucie, ABB Project Number, FP13469-1, Rev.1, August 25, 2008
Main Steam, Condensate and Feedwater Piping Supports Modifications	Increased steam and water flows in the uprate conditions require additional piping restraints	Bechtel PO-117820	BOP analysis of component capabilities in the power uprate conditions

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 Fall 2011 Outage	Description	Contract	Scoping Document
MSR Replacement	Larger capacity MSRs are required to heat and dry the steam flow in the uprate conditions	TEI PO-118205	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
CEDM System Modifications	Modify the CEDM system to recover operational and safety margins in the uprate conditions	Westinghouse PO-118271	OEM Recommendation
BOP Instrumentation	Setpoint and scaling of plant instrumentation for uprate conditions	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Nuclear Steam Supply System Plant Instrumentation	Setpoint and scaling of plant instrumentation for uprate conditions	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Safety Injection Tank Pressure Increase	Modification required to operate at higher pressure based on EPU conditions for small break Loss of Coolant Accident (LOCA) analysis	Bechtel PO-117820	EPU LAR Engineering
Steam Bypass Control System Unit 1 (DCS)	Add digital controls to the increased steam bypass system flow	Invensys PO-2263052	Engineering Design Modifications
Steam Bypass Flow to Condenser-Increase	Increased steam flow in the uprate conditions requires larger bypass capability to the main condenser	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Turbine Cooling Water Heat Exchanger Replacement	Larger heat exchangers are needed for increased cooling in the uprate conditions	TEI PO-118278	St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 Fall 2011 Outage	Description	Contract	Scoping Document
Transmission and Substation Modifications	At St. Lucie, metering and relay work, at Midway switchyard, switch replacement	T&D	Facilities Study, FPL EPU project, St. Lucie 1&2, Q114 & Q115, March 2009

2011 Extended Power Uprate (EPU) Project Work Activities

St. Lucie 2011 On-Line Activities	Description	Contract	Scoping Document
Training Simulator Modifications	Modifications needed to replicate the plant in the power uprate conditions	Western Services Corp. PO-118627	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Equipment Qualification Modifications	Ensure and document that the equipment being modified meets equipment quality standards	Bechtel PO-117820	Engineering Design Modifications
Diesel Oil Storage Tank (DOST) Operating Margin Modification	EPU required DOST capacity. Need loop seals in the fill & overflow lines	Bechtel PO-117820	EPU LAR Engineering
Umbrella Modification "EPU Wrap-up"	Provides the basis for plant to go to EPU conditions. Wraps up all mods, assesses all systems, updates misc procedures, FSAR, etc	Shaw PO-112221	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Construction Temporary Power	Provide Un-interruptable Construction Power for Turbine Bldg work to implement EPU	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Spent Fuel Pool (SFP) Criticality Modifications	Boraflex Remedy – Regulatory driven modification for more highly enriched fuel required for EPU	TBD	EPU LAR Engineering

2011 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Spring 2011 Outage	Description	Contract	Scoping Document
Heater Drain Valves Replacement	Larger valves are needed to control the condensate flow in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Heater #5 Drain Piping Modification	Higher drain water flows require larger piping in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Transformer Cooler Modification	Increased cooling is needed to handle the increase in the main generator electrical output	Siemens PO-122154	T&D
Switchyard Modifications	Increased electrical output requires modification to switchyard equipment to support the uprate conditions	T & D	Generation Interconnection Service and Network Resource Interconnection Service System Impact Study. 11/25/08
Feedwater Heaters (5,6) Replacement (partial)	Larger feedwater heaters are needed to process the steam and feedwater flows in the uprate conditions	TEI PO-118241	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
MUR LEFM (Spool Piece Only)	Precision flow measurement instrument and instrumentation provides for increased certainty of operating parameters supporting uprate conditions	Cameron PO-116796	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2011 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Spring 2011 Outage	Description	Contract	Scoping Document
Isophase Bus Duct Replacement	Increased bus size is needed for the electrical connections from the main generator to the main transformer in the uprate conditions	AZZ / Calvert PO-124436	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Heater Drains Digital Modifications (partial)	Instrumentation to provide control the feedwater heater control and dump valves in the uprate conditions	Invensys PO -126227	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Heaters 1-4 Inspections with Contingency PCM for Feedwater Heater Modifications	Perform inspections to determine needed modifications for the uprate conditions	Bechtel/NPS	BOP analysis of component capabilities in the power uprate conditions
Sump PH Control, Install NaTB Baskets (partial)	Alternate Source Term (AST) method requires pH greater than 7.0. The current pH control system is not sufficient at uprate conditions	S&L PO-79551	AST LAR Engineering
Installation of Main Condenser Basket Tips	Condenser Basket Tips are required to monitor the main turbine back pressure for pre and post-EPU conditions	Day Zimmermann NPS (NPS)	Siemens Contract PO-116090
Repowering of the Alternate PTN Unit3 SFP Cooling Pump Motor	Increased heat load on the SFP cooling system due to EPU conditions requires a 2nd cooling pump to be in operation	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2011 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Spring 2011 Outage	Description	Contract	Scoping Document
Main Transformer Deluge Piping Modification	Installation of Fire protection Deluge System to properly interface with the revised spatial envelop of the modified Main Transformer with Coolers	Bechtel PO-117809	Form 14, NP-EPU-09-1926 Deluge System
SFP Criticality Modifications	Boraflex Remedy – Regulatory driven modification for more highly enriched fuel required for EPU	TBD	EPU LAR Engineering

2011 Extended Power Uprate (EPU) Project Work Activities

Turkey Point 2011 On-Line Activities	Description	Contract	Scoping Document
Training Simulator Modifications	Modifications needed to replicate the plant in the power uprate conditions	Western Services PO-118844	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Control Room Habitability	Modify control room HVAC system to provide acceptable radiological doses to the control room operators at uprate conditions	Bechtel PO-117809	AST LAR Engineering
Alternate SFP Cooling – Units 3 & 4	Increased power from the fuel requires additional cooling of the fuel when it is placed into the SFP	Joseph Oats PO-2259675	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Turbine Digital Controls Modification – Units 3 & 4	Enhanced controls for the new turbines. Current design is not sufficient for the new turbine configuration in the uprate conditions	Invensys PO-129689	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Turbine Electro-Hydraulic Controls – Units 3 & 4	Enhanced controls for the new turbines. Current design is not sufficient for the new turbine configuration in the uprate conditions	Siemens PO-130272	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2011 Extended Power Uprate (EPU) Project Work Activities

Turkey Point 2011 On-Line Activities	Description	Contract	Scoping Document
MUR LEFM (Instrumentation) – Units 3 & 4	Precision flow measurement instrument and instrumentation provides for increased certainty of operating parameters supporting uprate conditions	Cameron PO-116796	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Environmental Qualifications Revise Documentation – Units 3 & 4	Ensure and document that the equipment being modified meets equipment quality standards	FPL	FPL PTN Feasibility Study 2007
Turbine Gantry Crane Modifications	Modifications needed to more efficiently and precisely move heavy EPU equipment loads	Bechtel PO-117809	Identified during scheduling and planning of moving EPU heavy equipment loads.
Units 3 & 4 High Head Safety Injection (HHSI) Pump Oil Change to Synthetic	Existing HHSI pump oil needs to be modified due to higher CCW temperatures caused by uprate conditions	Bechtel PO-117809	EPU LAR Engineering
Distributed Control System (DCS) – Interim Change to Computer Flux Map Program	Enables monitoring of the existing fuel design as it transitions to the new fuel design needed for the uprate	Zachry PO-115465	EPU LAR Engineering
Modify Technical Support Center (TSC) for Dose Reduction	Under uprate conditions, the TSC requires modifications to withstand increased radiation dose levels in a loss of coolant accident	Bechtel PO-117809	AST LAR Engineering

2011 Extended Power Uprate (EPU) Project Work Activities

Turkey Point 2011 On-Line Activities	Description	Contract	Scoping Document
Temporary Power for EPU	Insufficient temporary power sources are available to support uprate modifications during 3R26 and 4R27 outages	Bechtel PO-117809	Identified during analysis of temporary power needs by EPU personnel
Site Security Reconfiguration Modification	Additional laydown space and a new entrance through the security perimeter fencing to reduce schedule impacts is required to accommodate EPU modifications in the 2012 outages	TBD	Identified during analysis of site laydown needs for EPU equipment delivery, unloading and staging for 3R26 and 4R27 outages.
Feedwater Heaters #1, 2 and 4 Drain Piping Insulation	Removal of Asbestos Insulation and reinstall new insulation after inspections	NPS	Specification M-156
Add Valve Handwheel Extension for 867 Valves	A modification is required for the uprate for the uprate to install a reach rod, hand wheel and locking mechanism for SI valves ¾-867. This will allow manual isolation of the normal HHSI cold leg injection path should either MOV ¾-843 A/B fail to close when switching to the hot leg injection flow path	Bechtel PO-117809	EPU LAR Engineering

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Table 1. Summary of 2011 Extended Power Uprate Construction Costs

Category	Detail Table No.	2011 A/E Costs
Licensing	2	$19,797,804
Engineering & Design	3	$20,251,942
Permitting	4	$45,451
Project Management	5	$33,835,035
Power Block Engineering, Procurement, etc.	6	$498,985,033
Non-Power Block Engineering, Procurement, etc.	7	$6,097,647
Total EPU Construction Costs	**N/A**	**$579,012,913**
EPU Recoverable O&M	8	$12,701,007
Transmission Capital and Recoverable O&M	9	$18,071,916
Total Construction Costs & Transmission	**N/A**	**$609,785,836**

Tables include post in-service costs.

NFR Schedule AE 4, O&M and AE 6, Construction and Transmission costs amount to $600,552,244, which excludes post in-service project costs.

Table 2. 2011 Licensing Costs

Category	2011 A/E Costs
St. Lucie (PSL) License Amendment Request (LAR)	$13,937,396
Turkey Point (PTN) License Amendment Request (LAR)	$5,860,408
Total Licensing	**$19,797,804**

Table 3. 2011 Engineering and Design Costs

Category	2011 A/E Costs
St. Lucie (PSL)	
FPL and staff augmentation engineering	$10,158,565
Turkey Point (PTN)	
FPL and staff augmentation engineering	$10,093,377
Total Engineering and Design	**$20,251,942**

Table 4. 2011 Permitting Costs

Category	2011 A/E Costs
St. Lucie (PSL)	$11,689
Turkey Point (PTN)	$33,762
Total Permitting	**$45,451**

Table 5. 2011 Project Management Costs

Category	2011 A/E Costs
St. Lucie (PSL)	
FPL, staff augmentation, and regulatory accounting	$19,594,251
Turkey Point (PTN)	
FPL, staff augmentation, and regulatory accounting	$14,240,784
Total Project Management	**$33,835,035**

Table 6. 2011 Power Block Engineering, Procurement, Etc. Costs

Category	2011 A/E Costs
St. Lucie (PSL)	
FPL Procured Long Lead Material	$34,443,061
Turbine Generator Equipment procured from Siemens	$55,644,892
Siemens Labor - Alliance Agreement	$27,139,480
Bechtel EPC Contract	$89,721,693
Station Indirect Outage Costs	$8,422,777
Growth in Scope - Scope & Contingency	$32,937,249
Other Costs (plant support, office equipment, supplies)	$19,508,888
Adjustments (accounting timing)	($7,833,066)
St. Lucie (PSL)	**$259,984,974**
Turkey Point (PTN)	
FPL Procured Long Lead Material	$26,394,186
Turbine Generator Equipment procured from Siemens	$34,755,065
Siemens Labor - Alliance Agreement	$1,247,529
Bechtel EPC Contract	$111,164,397
Station Indirect Outage Costs	$5,636,364
Growth in Scope - Scope & Contingency	$29,807,831
Other Costs (plant support, office equipment, supplies)	$36,419,185
Adjustments (accounting timing)	($6,424,498)
Turkey Point (PTN)	**$239,000,059**
Total Power Block Engineering, Procurement, Etc.	**$498,985,033**

Table 7. 2011 Non-Power Block Engineering, Procurement, etc. Costs

Category	2011 A/E Costs
St. Lucie (PSL)	$2,824,000
Turkey Point (PTN)	$3,273,647
Total Non-Power Block Engineering, Procurement, etc.	**$6,097,647**

Table 8. 2011 Recoverable O&M Costs

Category	2011 A/E Costs
St. Lucie (PSL) and Turkey Point (PTN)	
Non capitalizable Feedwater Heater Inspections & Other Minor O&M Scopes	$5,959,159
PTN Independent Spent Fuel Storage Installation (ISFSI) Pad Relocation	$6,015,000
Non capitalizable computer hardware and software, office furniture and fixtures for new project-bound hires, incremental staff and augmented contract staff.	$726,848
Total Recoverable O&M	**$12,701,007**

Table 9. 2011 Transmission Costs

Category	2011 A/E Costs
Plant Engineering	$12,628,735
Line Engineering	$3,706
Substation Engineering	$486,671
Line Construction	$33,294
Substation Construction	$4,913,601
Recoverable O&M	$5,909
Total Transmission	**$18,071,916**

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2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 2 Summer 2012 Outage	Description	Contract	Scoping Document
Condensate Pump Replacement	Larger condensate pumps are needed to pump the increased condensate flows in the uprate conditions	Flowserve Corp. PO-130160	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, Balance of Plant (BOP), EPU, Scoping Study, February 2008
Condenser Material Modification	Strengthening of the Main Condenser is needed with higher steam and condensate flows in the uprate conditions	BPC PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Control Room Modification	Additional cooling and Alternate Source Term margin required for power uprate conditions	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Feedwater Digital Modifications	Instrumentation to provide control the feedwater heater control and dump valves in the uprate conditions	Feedforward SC2287468	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Digital Electro-Hydraulic Computer System Modification	Modifications needed for increased certainty of turbine operating parameters supporting uprate conditions	Westinghouse PO-131940	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Electrical Bus Margin Modifications	Required to restore margin on electrical busses as a result of uprate	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Piping Vibration Modifications	Required to correct resistance caused by increased loads at EPU conditions	BPC PO-117820	BOP analysis of component capabilities under EPU conditions
Feedwater Heater Replacement (#5 A/B)	Larger feedwater heaters are needed to process the steam and feedwater flows in the uprate conditions	TEI PO-118224	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008

2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 2 Summer 2012 Outage	Description	Contract	Scoping Document
Feedwater Heaters 4A and 4B Partition Plate Inspections and Modifications	Perform inspections to determine needed modifications for the uprate conditions	BPC PO-117820	BOP analysis of component capabilities in the power uprate conditions
Feedwater Regulating Valves Modification	Larger operating mechanisms are required to operate the feedwater regulating valves in the increased uprate conditions	Fisher Controls SC2262515	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Moisture Separator Drain Control Valves Replacement	Larger valves are needed for the increased condensed water flow in the uprate conditions	Fisher Controls SC2262201	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Heater Drain/MSR Digital Controls	Addition of digital controls to the new MSRs and Drain Coolers due to EPU conditions	BPC PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Heater Drain Pump and Motor Replacements	Larger pumps and motors are required to pump the increased heater drain flows in the uprate conditions	Flowserve Corp. PO- 125454	St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
High Pressure (HP) Turbine	Larger HP rotor and inlet valves are required for increased steam flows in the uprate conditions	Siemens PO-116088	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, Balance of Plant, EPU, Scoping Study, February 2008
Isophase Bus Duct Cooling	Increased cooling is needed for the electrical connections from the main generator to the main transformer in the uprate conditions	AZZ Calvert PO-120769	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008

2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 2 Summer 2012 Outage	Description	Contract	Scoping Document
Leading Edge Flow Meter (LEFM) Measurement Uncertainty Recapture (MUR)	Precision flow measurement instrument and instrumentation provides for increased certainty of operating parameters supporting uprate conditions	Cameron PO-116107	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Feedwater Pump Replacement	Larger pumps are required to pump the increased feedwater flow required in the uprate conditions	Flowserve PO-121985	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Transformer Replacement Unit 2A	Larger main transformers are needed to handle the increase in the main generator electrical output	Siemens PO-4500467077	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Main Steam, Condensate, and Feedwater Piping Support Modifications	Strengthening required due to increased loads under EPU conditions	Bechtel PO-117820	BOP analysis of component capabilities under power uprate conditions
Moisture Separator Reheater (MSR) Replacement	Larger capacity MSRs are required to heat and dry the steam flow in the uprate conditions	TEI PO-118205	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
BOP Instrumentation	Setpoint and scaling of plant instrumentation for uprate conditions	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Nuclear Steam Supply System (NSSS) Plant Instrumentation	Setpoint and scaling of plant instrumentation for uprate conditions	Bechtel PO-117820	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Increase Steam Bypass Flow to Condenser Modifications	Modifications required due to increased bypass flow to condenser from main steam, feed water and heater drains	Bechtel PO-117820	EPU License Amendment Request (LAR) Engineering

2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 2 Summer 2012 Outage	Description	Contract	Scoping Document
Turbine Cooling Water Heat Exchanger Replacement	Larger heat exchangers are needed for increased cooling in the uprate conditions	TEI PO-118278	St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
GL2008-01 CVCS System	NRC Generic Letter (GL2008-01) requires licensees to ensure emergency systems are capable of being vented at their water high points to minimize air entrapment when the system is required to function	Alion 129895	Identified during the LAR engineering review.
Component Cooling Water (CCW) Piping & Support Modifications	Strengthening required due to increased thermal conditions under EPU	Bechtel PO-117820	BOP analysis of component capabilities under power uprate conditions
Containment Temperature Resistance Temperature Detector (RTD) Modifications	Existing RTDs not Equipment Qualification (EQ) related components. EPU conditions subject these components to more harsh environment	Bechtel PO-117820	EPU LAR Engineering
Feedwater Vent Orifice & Relief Valve Resizing	Feedwater Heater Shell Side must be capable of relieving 10% of FW flow under EPU conditions	Bechtel PO-117820	BOP analysis of component capabilities under power uprate conditions
Containment Spray Pump Flow Impact Modifications	EDG frequency deviation for EPU conditions impacts ability of pumps to operate under injection and recirculation modes. Replacement impellers and throttling bypass valves required	Bechtel PO-117820	EPU LAR Engineering

2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 2 Summer 2012 Outage	Description	Contract	Scoping Document
Isophase Bus Supports	Bus taps to Aux and Start-Up transformers are undersized and under-supported for short circuit under EPU conditions	Bechtel PO-117820	EPU LAR Engineering
Distributed Control System for LEFM and Feedwater Controls	Mandatory scaling changes required to provide accurate control under EPU conditions	Feedforward SC2287468	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Transmission and Substation modifications	Implement meter and relaying modifications at St. Lucie and replace switches in the St. Lucie switchyard. At the Midway switchyard, #1, #2, #3 increase ampacity, replace switches, and fiber optic protection	T&D	Facilities Study, FPL EPU project, St. Lucie 1&2, Q114 & Q115, March 2009

2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie 2012 On-Line Activities	Description	Contract	Scoping Document
Training Simulator Modifications	Modifications needed to replicate the plant in the power uprate conditions	Western Services Corp. PO-118627	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
EQ Modifications	Ensure and documents that the equipment being modified meets equipment quality standards	BPC PO-117820	Engineering Design Modifications

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 Spring 2012 Outage	Description	Contract	Scoping Document
Sump PH Control, Install NaTB Baskets	Alternate Source Term method requires pH greater than 7.0. The current pH control system is not sufficient at uprate conditions	S&L PO-79551	AST LAR Engineering
Feedwater Heater Drains of Digital Modifications	Instrumentation to provide control the feedwater heater level control and dump valves in the uprate conditions	Invensys PO -126227	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Turbine Digital Controls Modification – Units 3 & 4	Enhanced controls for the new turbines. Current design is not sufficient for the new turbine configuration in the uprate conditions	Invensys PO-129689	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
MUR LEFM (Instrumentation) – Units 3 & 4	Precision flow measurement instrument and instrumentation provides for increased certainty of operating parameters supporting uprate conditions	Cameron PO-116796	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Isophase Bus Duct Replacement	Increased bus size is needed for the electrical connections from the main generator to the main transformer in the uprate conditions	AZZ / Calvert PO-124436	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
BOP Instrumentation Modifications	Increased pressures and flows require modifications and adjustments to process instrumentation in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 Spring 2012 Outage	Description	Contract	Scoping Document
Switchyard Modifications	Increased electrical output requires modification to switchyard equipment to support the uprate conditions	T & D	Generation Interconnection Service and Network Resource Interconnection Service System Impact Study. 11/25/08
Feedwater Isolation Valves Addition	Increased feedwater flow and pressure requires modifications to support uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Regulating Valves Modification	Larger actuators and valve internals are required to operate the feedwater regulating valves in the increased uprate conditions	SPX PO-115351	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Heater Drain Valves	Larger valves are needed to control the condensate flow in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Heater #5 Drain Piping Modification	Higher drain water flows require larger piping in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Steam Isolation Valve Assembly Replacement	Satisfies new steam system pressure requirements at the HP turbine	Bechtel PO-117809	EPU LAR Engineering
Main Steam Safety Valve / Piping Modifications	Increased temperature and pressure require set point changes in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Flow Accelerated Corrosion Identified Piping Replacement	Increased flows require replacement of piping affected by the flow accelerated corrosion in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 Spring 2012 Outage	Description	Contract	Scoping Document
HP Turbine Modification	Larger inlet throttle valves and Turbine redesign are required for increased steam flows in the uprate conditions	Siemens PO-116090	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Generator Rotor Replacement	Larger generator and stator are needed to increase electrical output in the uprate conditions.	Siemens PO-116090	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Generator Hydrogen Coolers	Increased main generator cooling is required in the uprate conditions.	Siemens PO-116090	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Turbine Electro-Hydraulic Controls	Enhanced controls for the new turbines. Current design is not sufficient for the new turbine configuration in the uprate conditions	Siemens PO-130272	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
MSR Replacement	Larger capacity MSRs are required to heat and dry the steam flow in the uprate conditions	TEI PO-118206	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Condenser replacement	Increased turbine exhaust steam to the main condenser requires replacement of the main condenser to support uprate conditions	TEI PO-118328	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Condenser Tube Cleaning System (Amertap)	Replacement of the main condenser requires replacement of the condenser tube cleaning system to support the uprate conditions	TEI PO-118328	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 Spring 2012 Outage	Description	Contract	Scoping Document
Containment Cooling Modifications	Increased power production from the primary system requires additional cooling of the containment in the uprate conditions	AAF McQuay PO-121869	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Spent Fuel Pool (SFP) Cooling Heat Exchanger Modification	Increased power from the fuel requires additional cooling of the fuel when it is placed into the SFP	Joseph Oats PO-2259675	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Pressurizer Safety Valve Setpoint Change	A Pressurizer Safety Valve Setpoint change is required to meet the peak Reactor Coolant System pressure in the analyzed Loss of Level/Turbine Trip (LOL/TT) event	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Emergency Containment Filter Removal	Abandon containment filters from the containment to support the safety margin in the uprate conditions.	Bechtel PO-117809	FPL PTN Feasibility Study 2007
Condensate Pump and Motor Replacement	Larger condensate pumps are needed to pump the increased condensate flows in the uprate conditions	Flowserve PO-130612	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Feed Pump Replacement	Rotating assemblies need redesign to pump the increased feedwater flow required in the uprate conditions	Flowserve PO-130612	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
ICW Turbine Plant Cooling Water Cooling Modification	Increased temperatures of components require additional cooling in the uprate conditions	Joseph Oat Corp. PO-126453	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Heaters (5A/B, 6A/B)	Larger feedwater heaters are needed to process the steam and feedwater flows in the uprate conditions	TEI PO-118241	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 Spring 2012 Outage	Description	Contract	Scoping Document
Instrumentation & Control Pressurizer Setpoint / Control / Indication Changes	Changes to NSSS and BOP instrumentation are required to meet EPU conditions	Bechtel PO-117809	EPU LAR Engineering
Main Steam Pressure Lead/Lag Module Install and Eagle 21 Changes	Modifications for licensing, design basis, plant program changes, I&C scaling and setpoint changes identified to support EPU conditions	Westinghouse PO-119078	EPU LAR Engineering
Main Steam Pipe Supports Replacement	Uprate conditions require additional piping supports and restraints	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
HP Turbine Supply Spill Over Piping Replacement	Modifications needed for increased HP Turbine exhaust pressures and spillover	Bechtel PO-117809	EPU LAR Engineering
Secondary Instrumentation Setpoint Changes	Changes to NSSS and BOP instrumentation are required to meet EPU conditions	Bechtel PO-117809	EPU LAR Engineering
Unit 3 Umbrella Mod – LAR Documentation Only	Non-hardware modifications implementing configuration management of licensing, design basis and plant program changes as a result of EPU	Enercon PO-2285720	EPU LAR Engineering
Containment Aluminum Reduction	EPU increases containment sump temperature which accelerates aluminum degradation	Zachry PO 115465	EPU LAR Engineering
Hot Leg Injection Alternate Flow Path	Evaluate/modify current design for alternate Hot Leg flow path which contains a single-failure deficiency for post-Loss of Coolant Accident (LOCA) Hot Leg Recirculation	Bechtel PO-117809	EPU LAR Engineering

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 Spring 2012 Outage	Description	Contract	Scoping Document
Plant Documentation Changes resulting from Westinghouse Setpoint and Scaling Changes	Documentation update and identification of setpoint / scaling changes to plant computer systems software for NSSS systems as a result of EPU	Bechtel PO-117809	EPU LAR Engineering
Main Steam Flow Element Replacement	Satisfies new steam system pressures requirements at the HP turbine	Bechtel PO-117809	EPU LAR Engineering
Steam Generator Blowdown Flow Instrumentation Modifications	Modifications needed to improve measurement accuracy of Steam Generator blowdown	Bechtel PO-117809	EPU LAR Engineering
CCW Pipe Support Modifications	CCW Pipe Supports need to be evaluated/modified to ensure design basis is met under EPU conditions	Bechtel PO-117809	EPU LAR Engineering
Steam Jet Air Ejector Condenser Tube Bundle Replacement	Modification needed to SJAE condenser due to increased condensate system pressure resulting from uprate	Bechtel PO-117809	EPU LAR Engineering
Heater Drain System Pressure Re-rate	Piping modifications required to meet EPU conditions	Bechtel PO-117809	EPU LAR Engineering
Control Rod Drive Mechanism Fan Motor and Cooling Coil Replacement	Fan motor modification needed because of increased containment temperatures caused by EPU conditions. Cooling coil material being changed to copper to reduce the amount of aluminum in containment to meet AST requirements	Bechtel PO-117809	AST LAR Engineering

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 Spring 2012 Outage	Description	Contract	Scoping Document
Repowering of the Alternate PTN Unit 4 SFP Cooling Pump Motor	Increased heat load on the SFP cooling system due to EPU conditions requires a 2nd cooling pump to be in operation	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Fall 2012 Outage	Description	Contract	Scoping Document
Sump PH Control, Install NaTB Baskets	Alternate Source Term method requires pH greater than 7.0. The current pH control system is not sufficient at uprate conditions	S&L PO-79551	AST LAR Engineering
Switchyard Modifications	Increased electrical output requires modification to switchyard equipment to support the uprate conditions	T & D	Generation Interconnection Service and Network Resource Interconnection Service System Impact Study. 11/25/08
Feedwater Heater Drains Digital Modifications	Instrumentation to provide control the feedwater heater control and dump valves in the uprate conditions	Invensys PO -126227	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Turbine Digital Controls Modification	Enhanced controls for the new turbines. Current design is not sufficient for the new turbine configuration in the uprate conditions	Invensys PO-129689	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
MUR LEFM (Instrumentation)	Precision flow measurement instrument and instrumentation provides for increased certainty of operating parameters supporting uprate conditions	Cameron PO-116796	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
BOP Instrumentation Modifications	Increased pressures and flows require modifications and adjustments to process instrumentation in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Isolation Valves Addition	Increased feedwater flow and pressure requires modifications to support uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Fall 2012 Outage	Description	Contract	Scoping Document
Feedwater Regulating Valves Modification	Larger actuators and valve internals are required to operate the feedwater regulating valves in the increased uprate conditions	SPX PO-115351	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Heater Drain Valves Replacement	Larger valves are needed to control the condensate flow in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Heater #5 Drain Piping Modification	Higher drain water flows require larger piping in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Steam Isolation Valve Assembly Replacement	Satisfies new steam system pressures requirements at the HP turbine	Bechtel PO-117809	EPU LAR Engineering
Main Steam Safety Valve / Piping Modifications	Increased temperature and pressure require set point changes in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
HP Turbine Modification	Larger inlet throttle valves and Turbine redesign are required for increased steam flows in the uprate conditions	Siemens PO-116090	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Generator Rotor Replacement	Larger generator and stator are needed to increase electrical output in the uprate conditions	Siemens PO-116090	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Generator Hydrogen Coolers	Increased main generator cooling is required in the uprate conditions	Siemens PO-116090	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Fall 2012 Outage	Description	Contract	Scoping Document
Turbine Electro-Hydraulic Controls	Enhanced controls for the new turbines. Current design is not sufficient for the new turbine configuration in the uprate conditions	Siemens PO-130272	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
MSR Replacement	Larger capacity MSRs are required to heat and dry the steam flow in the uprate conditions	TEI PO-118206	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Condenser replacement	Increased turbine exhaust steam to the main condenser requires replacement of the main condenser to support uprate conditions	TEI PO-118328	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Condenser Tube Cleaning System Replacement (Amertap)	Replacement of the main condenser requires replacement of the condenser tube cleaning system to support the uprate conditions	TEI PO- 118328	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Containment Cooling Modifications	Increased power production from the primary system requires additional cooling of the containment in the uprate conditions	AAF McQuay PO-121869	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Spent Fuel Pool Cooling Heat Exchanger Replacement	Increased power from the fuel requires additional cooling of the fuel when it is placed into the spent fuel pool	Joseph Oats PO-2259675	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Pressurizer Safety Valve Setpoint Change	A Pressurizer Safety Valve Setpoint change is required to meet the peak Reactor Coolant System pressure in the LOL/TT event	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Fall 2012 Outage	Description	Contract	Scoping Document
Emergency Containment Filter Removal	Abandon containment filters from the containment to support the safety margin in the uprate conditions	Bechtel PO-117809	FPL PTN Feasibility Study 2007
Condensate Pump and Motor Replacement	Larger condensate pumps are needed to pump the increased condensate flows in the uprate conditions	Flowserve PO-130612	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Feed Pump Replacement	Rotating assemblies need redesign to pump the increased feedwater flow required in the uprate conditions	Flowserve PO-130612	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
ICW Turbine Plant Cooling Water Cooling Modification	Increased temperatures of components require additional cooling in the uprate conditions	Joseph Oat Corp. PO-126453	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Feedwater Heaters (5A/B, 6A/B)	Larger feedwater heaters are needed to process the steam and feedwater flows in the uprate conditions	TEI PO-118241	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Main Steam Pressure L/L Module Install and Eagle 21 Changes	Modifications for licensing, design basis, plant program changes, I&C scaling and setpoint changes identified to support EPU conditions	Westinghouse PO-119078	EPU LAR Engineering
Pressurizer Setpoint / Control / Indication Changes	Changes to NSSS and BOP instrumentation are required to meet EPU conditions	Bechtel PO-117809	EPU LAR Engineering
Main Steam Pipe Supports Replacement	Uprate conditions require additional piping supports and restraints	Bechtel PO-117809	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Fall 2012 Outage	Description	Contract	Scoping Document
HP Turbine Supply Spill Over Piping Replacement	Modifications needed for increased HP Turbine exhaust pressures and spillover	Bechtel PO-117809	EPU LAR Engineering
Secondary Instrumentation Setpoint Changes	Changes to NSSS and BOP instrumentation are required to meet EPU conditions	Bechtel PO-117809	EPU LAR Engineering
Unit 4 Umbrella Mod – LAR Doc Only	Non-hardware modifications implementing configuration management of licensing, design basis and plant program changes as a result of EPU	Enercon PO-2285720	EPU LAR Engineering
Containment Aluminum Reduction	EPU increases containment sump temperature which accelerates aluminum degradation	Zachry PO 115465	EPU LAR Engineering
Hot Leg Injection Alternate Flow Path	Evaluate/modify current design for alternate Hot Leg flow path which contains a single-failure deficiency for post-LOCA Hot Leg Recirculation	Bechtel PO-117809	EPU LAR Engineering
Plant Doc Changes resulting from Westinghouse Setpoint and Scaling Changes	Documentation update and identification of setpoint / scaling changes to plant computer systems software for NSSS systems as a result of EPU	Bechtel PO-117809	EPU LAR Engineering
Main Steam Flow Element Modifications	Satisfies new steam system pressures requirements at the HP turbine	Bechtel PO-117809	EPU LAR Engineering

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 Fall 2012 Outage	Description	Contract	Scoping Document
Steam Generator Blowdown Flow Instrumentation	Modifications needed to improve measurement accuracy of Steam Generator blowdown	Bechtel PO-117809	EPU LAR Engineering
CCW Pipe Support Modifications	CCW Pipe Supports need to be evaluated/modified to ensure design basis is met under EPU conditions	Bechtel PO-117809	EPU LAR Engineering
Steam Jet Air Ejector Condenser Tube Bundle Replacement	Modification needed to SJAE condenser due to increased condensate system pressure resulting from uprate	Bechtel PO-117809	EPU LAR Engineering
Heater Drain System Pressure Re-rate	Piping modifications required to meet EPU conditions	Bechtel PO-117809	EPU LAR Engineering
Control Rod Drive Mechanism Fan Motor and Cooling Coil Replacement	Fan motor modification needed because of increased containment temperatures caused by EPU conditions. Cooling coil material being changed to copper to reduce the amount of aluminum in containment to meet AST requirements	Bechtel PO-117809	AST LAR Engineering

Extended Power Uprate (EPU) Project Work Activities

Turkey Point 2012 On-Line Activities	Description	Contract	Scoping Document
Training Simulator Modifications	Modifications needed to replicate the plant in the power uprate conditions	Western Services PO-118844	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
EQ Update Documentation – Units 3 & 4	Ensure and document that the equipment being modified meets equipment quality standards	FPL	FPL PTN Feasibility Study 2007
Post EPU Condenser Amertap Cleaning System Units 3 & 4	Replacement of the main condenser requires replacement of the condenser tube cleaning system to support the uprate conditions	TEI PO- 118328	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008
Add Valve Operator Extension Handwheel to Safety Injection Valve 3-867 and 4-867	Modification makes motor operated valve accessible to allow manual isolation to accommodate EPU conditions	Bechtel PO-117809	EPU LAR Engineering

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Table 1. Summary of 2012 Extended Power Uprate Construction Costs

Category	Detail Table No.	2012 Projected Costs
Licensing	2	$5,312,846
Engineering & Design	3	$11,091,593
Permitting	4	$0
Project Management	5	$26,330,854
Power Block Engineering, Procurement, etc.	6	$722,606,534
Non-Power Block Engineering, Procurement, etc.	7	$447,127
Total EPU Construction Costs	**N/A**	**$765,788,954**
EPU Recoverable O&M	8	$5,611,503
Transmission Capital and Recoverable O&M	9	$27,238,132
Total Construction Costs & Transmission	**N/A**	**$798,638,589**

Tables include post in-service costs.

NFR Schedule P4, O&M and P6, Construction and Transmission costs amount to $741,809,930, which excludes post in-service project costs.

Table 2. 2012 Licensing Costs

Category	2012 Projected Costs
St. Lucie (PSL) License Amendment Request (LAR)	$4,265,500
Turkey Point (PTN) License Amendment Request (LAR)	$1,047,346
Total Licensing	**$5,312,846**

Table 3. 2012 Engineering and Design Costs

Category	2012 Projected Costs
St. Lucie (PSL)	
FPL and staff augmentation engineering	$3,698,057
Turkey Point (PTN)	
FPL and staff augmentation engineering	$7,393,536
Total Engineering and Design	**$11,091,593**

Table 4. 2012 Permitting Costs

Category	2012 Projected Costs
St. Lucie (PSL)	$0
Turkey Point (PTN)	$0
Total Permitting	**$0**

Table 5. 2012 Project Management Costs

Category	2012 Projected Costs
St. Lucie (PSL)	
FPL, staff augmentation, and regulatory accounting	$12,227,854
Turkey Point (PTN)	
FPL, staff augmentation, and regulatory accounting	$14,103,000
Total Project Management	**$26,330,854**

Table 6. 2012 Power Block Engineering, Procurement, Etc. Costs

Category	2012 Projected Costs
St. Lucie (PSL)	
FPL Procured Long Lead Material	$7,294,879
Turbine Generator Equipment procured from Siemens	$34,580,857
Siemens Labor - Alliance Agreement	$30,987,884
Bechtel EPC Contract	$82,647,203
Station Indirect Outage Costs	$16,564,755
Growth in Scope - Scope & Contingency	$110,122,525
Other Costs (plant support, office equipment, supplies)	$12,070,429
Adjustments (accounting timing)	($21,262,142)
St. Lucie (PSL)	**$273,006,390**
Turkey Point (PTN)	
FPL Procured Long Lead Material	$35,178,488
Turbine Generator Equipment procured from Siemens	$43,623,580
Siemens Labor - Alliance Agreement	$37,811,580
Bechtel EPC Contract	$166,698,640
Station Indirect Outage Costs	$19,727,273
Growth in Scope - Scope & Contingency	$129,990,207
Other Costs (plant support, office equipment, supplies)	$58,571,188
Adjustments (accounting timing)	($42,000,812)
Turkey Point (PTN)	**$449,600,144**
Total Power Block Engineering, Procurement, Etc.	**$722,606,534**

Table 7. 2012 Non-Power Block Engineering, Procurement, etc. Costs

Category	2012 Projected Costs
St. Lucie (PSL)	$447,127
Turkey Point (PTN)	$0
Total Non-Power Block Engineering, Procurement, etc.	**$447,127**

Table 8. 2012 Recoverable O&M Costs

Category	2012 Projected Costs
St. Lucie (PSL) and Turkey Point (PTN)	
Non capitalizable Feedwater Heater Inspections & Other Minor O&M Scopes	$4,740,000
PTN Independent Spent Fuel Storage Installation (ISFSI) Pad Relocation	$0
Non capitalizable computer hardware and software, office furniture and fixtures for new project-bound hires, incremental staff and augmented contract staff.	$871,503
Total Recoverable O&M	**$5,611,503**

Table 9. 2012 Transmission Costs

Category	2012 Projected Costs
Plant Engineering	$8,412,798
Line Engineering	$0
Substation Engineering	$147,000
Line Construction	$0
Substation Construction	$18,678,334
Recoverable O&M	$0
Total Transmission	**$27,238,132**