BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 120009-EI
FLORIDA POWER & LIGHT COMPANY

APRIL 27, 2012

IN RE: NUCLEAR POWER PLANT COST RECOVERY
FOR THE YEARS ENDING
DECEMBER 2012 AND 2013

TESTIMONY & EXHIBITS OF:

TERRY O. JONES

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

DIRECT TESTIMONY OF TERRY O. JONES

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April 27, 2012

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. **What are the key things to know about the Extended Power Uprate project during 2012 and looking ahead to project completion in early 2013?**

A. Here are the key things to know about the Extended Power Uprate (EPU or Uprate) project during 2012 and looking ahead to project completion in early 2013:

- It is a complex project in its final phase with huge benefits for FPL customers and for Florida for decades to come;
- The project provides the equivalent output of half a new nuclear plant in about half the time and at significantly less than the estimated cost per kW installed of a new nuclear plant – a strong value proposition;

- We now expect 490 megawatts electric (MWe) of output that will save customers over $114 million in fossil fuel costs in the first year;
- The project will contribute substantially to electric grid reliability by producing power near a major economic center for the state, southeast Florida.

Q. Will most of the project be done this year?

A. Yes. By year end, uprates of three of our four nuclear reactors will be complete. In particular:

- Five of eight EPU outages are complete, and we are midway through the sixth as of the date of this testimony; and
- The remaining EPU outages are the second (and final) at Turkey Point Unit 4 and the second (and final) at St. Lucie Unit 2.

Q. Is FPL expecting more power to be produced from the EPU project than was estimated last year?

A. Yes. FPL's EPU project is in full swing to provide 490 MWe of additional nuclear generation for FPL's customers during 2012 and early 2013, compared with last year's projection of 450 MWe. This is enough to meet the electricity needs of over 311,000 residential customers -- without natural gas or foreign oil usage or greenhouse gas emissions.

Q. In addition to the annual fuel cost savings you mentioned, how will the EPU project benefit customers?

A. The EPU project is expected to reduce fossil fuel usage by the equivalent of 6 million barrels of oil per year. FPL's CO2 emissions are projected to be lower by 32 million tons over the project's life. The EPU project makes more electricity close to where the most is used, enhancing electric grid stability and electric service reliability for FPL's customers. The EPU project adds to Florida's energy security because it does not depend on fuel delivery through Florida's only two natural gas pipelines.

Q. How will the EPU project deliver economic value for FPL's customers?

A. The EPU project provides customers with exceptional value. Even at this time of historically low natural gas and environmental cost forecasts -- which no one should bet on remaining permanently at these low levels -- our current economic snapshot shows the EPU project is expected to save customers billions of dollars in fuel costs over decades. If natural gas and environmental costs increase in future years, customers would save even more money due to the EPU project. Simply put, the EPU project provides a valuable hedge against future natural gas and environmental cost increases, as part of FPL's overall portfolio of resources used to provide economical and reliable electricity for customers.

Q. How does the EPU project compare with installing new nuclear generation?

A. As mentioned, the EPU project will provide about 9% more generation than was estimated last year. At 490 MWe, the project's generation is about half the output of a new nuclear plant, yet is delivered now from existing reactors, much faster than a new plant can be built, and at a lower cost. The EPU project will result in nuclear generation capacity installed at a significantly lower cost per kW now as compared to a new nuclear power plant ten years from now.

Q. What effort is needed to complete the project?

A. The EPU project and the effort that it requires are enormous. Fortunately, we have thousands of qualified people working hard to provide about 20 million total hours of work, including over 4 million man-hours of engineering alone, to complete the largest U.S. nuclear project undertaken since new plants were constructed decades ago.

Q. Is FPL on track to successfully complete the project?

A. Yes. FPL is rigorously and transparently managing the EPU project with the end clearly in sight. Three reactor uprates will be completed during 2012 and deliver 367 MWe of nuclear capacity. The fourth reactor uprate will be finished in early 2013, adding another 123 MWe – for the project total of 490 MWe of around-the-clock, zero emission, low fuel cost electric generation that will serve FPL customers and Florida for decades.

PROJECT OVERVIEW

Q. Please provide an overview of the EPU project.

A. FPL is continuing to work to deliver the substantial benefits of additional nuclear generating capacity to its customers through the EPU project – and will complete that work in early 2013 as planned. Upon completion, FPL estimates that approximately 490 MWe of baseload, non-greenhouse gas emitting generation will be provided by the EPU project for its customers, all without expanding the footprint of its existing nuclear generating plants. In addition to the 31 MWe already being provided by the EPU project, FPL will bring on line approximately 336 MWe by the end of 2012. Completion of the EPU project in 2013 will add approximately 123 MWe, for a total of 490 MWe. The substantial benefits to FPL's customers from this additional nuclear generation will be realized at least a decade earlier than if additional nuclear generation were to be delivered solely through new nuclear units, and at a significantly lower cost per kilowatt.

Q. Please elaborate on the managerial and technical challenges of the project.

A. The EPU project poses extraordinary managerial and technical challenges. 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 previous generation of U.S. nuclear plants. As of April 2012, FPL estimates that the project will require the orchestration and management of over 4 million man-hours of engineering and total EPU project work of approximately 20 million man-hours.

This is the equivalent of approximately 1,800 person-years of engineering time and 10,000 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 that maintains nuclear and industrial safety.

Q. Is the project remaining on schedule for completion?

A. Yes. Despite all of its complexities, FPL is progressing with the implementation of the EPU project on the expedited basis approved by the Commission. At the time of this filing, the status of the EPU project can be summarized as follows:

- Approximately 90% of design engineering is complete;
- Approximately 12 million out of approximately 20 million hours of EPU work are complete;
- Five out of eight EPU outages are complete and we are in the midst of the sixth; and
- 31 MWe of nuclear power from the project are already serving customers.

Q. Where do you expect the project to be by year-end 2012?

A. A huge amount of implementation work is underway and will be completed this year. By the end of 2012, progress on the EPU project will reflect the following:

- 367 MWe will be serving customers
- Seven out of eight EPU outages, plus a short mid-cycle implementation outage, will be complete;
- The design engineering will be complete; and

- Approximately 18 million out of approximately 20 million hours of EPU work will be complete.

Q. What magnitude of investment is FPL making in the EPU project during 2012 and 2013?

A. As detailed in this testimony and accompanying exhibits, FPL plans to invest a total of approximately $1,100 million during 2012 and approximately $200 million during 2013 in the Uprate project. This investment will be recovered through base rates over the decades that the Uprate project will provide service. In comparison, consistent with the Nuclear Cost Recovery statute and rule, FPL is requesting only the recovery of carrying charges, O&M expenses, and partial-year revenue requirements of approximately $130 million for the EPU project through the NCRC in 2013.

FPL also plans to place the remaining Uprate project components into service. The estimated equipment in-service amounts for 2012 are approximately $1,640 million, and for 2013 are approximately $720 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.

Q. How do these project costs translate into FPL's nuclear cost recovery clause request for 2013?

A. The EPU amount contributes to a total Company request of approximately $151 million in 2013, which includes Turkey Point 6 & 7 cost recovery as described by FPL Witness Powers. This equates to a residential customer monthly bill impact of $1.68 per 1,000 kWh. This is fifty two cents per 1,000 kWh less and 24% lower than FPL's currently authorized nuclear cost recovery amount.

Q. Has FPL updated its non-binding cost estimate for the project?

A. Yes. Along with the work described above, FPL has worked to update the non-binding total cost estimate range to reflect the best information known at this time, in light of the substantial progress that has been made on the project and continuing diligence in the management of vendor resources and projections.

Q. What information is available this year that was not available last year?

A. As described in more detail below, last year FPL had completed approximately 36% of EPU engineering at the time of this filing. Today, over 90% of engineering is complete, with remaining outage work that is very similar to work that has already been completed during prior outages. Additionally, FPL has been able to perform a great deal of detailed construction planning which makes knowing what is required for the job more definitive in terms of people, equipment, and materials.

Q. What is the revised non-binding cost estimate range?

A. The revised non-binding cost estimate range is $2,950 million to $3,150 million, including transmission and carrying costs. For purposes of the 2012 economic feasibility analysis, FPL has utilized a total project cost estimate of $3,050 million.

Q. Is completing the project cost-effective at the new estimate?

A. Yes. While the current non-binding cost estimate is higher than the non-binding cost estimate used in the economic analyses conducted last year, the testimony and exhibits of FPL Witness Dr. Sim show that completion of the EPU project continues to be projected to provide large economic benefits for FPL's customers. 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 $296 million in cumulative present value of revenue requirements compared to a plan without the EPU project. To the extent natural gas and environmental compliance costs increase in the future above their current projected values, the cost savings attributable to the EPU project being in FPL's portfolio would also increase.

Q. Please provide the specific facts and figures of the benefits of the EPU project for FPL's customers.

A. After accounting for all relevant updates, including lower than previously forecasted natural gas prices, completing the EPU project is the most economic choice for customers in 6 out of 7 potential future fuel and environmental cost scenarios. Further, FPL expects that the EPU project will:

- Provide estimated fossil fuel cost savings for customers of approximately $114 million in the first full year of operation;
- Provide estimated fossil fuel cost savings for FPL's customers over the life of the plants of approximately $3.8 billion (nominal);

- Diversify FPL's fuel sources by decreasing reliance on natural gas and foreign oil. Addition of the EPU project will reduce FPL's reliance on natural gas by 3% beginning in the first full year of operation, providing an important hedge against volatile natural gas prices, and helping to reduce reliance on Florida's limited natural gas transportation infrastructure;
- Provide a total amount of energy that is equivalent to the usage of 311,578 residential customers each year;
- Reduce annual fossil fuel usage by the equivalent of 6 million barrels of oil or 41 million mmBTU of natural gas annually;
- Reduce system CO_2 emissions by an estimated 32 million tons over the life of the plants; and
- Provide generation in the Southeast portion of FPL's service area, helping to mitigate against a growing generation-load imbalance.

The quantifications of these benefits are set forth in FPL Witness Dr. Sim's testimony and Exhibit SRS-1. These benefits are also discussed in the Long Term Feasibility section of my testimony, and are presented in my Exhibit TOJ-15.

Q. Are there additional benefits being provided by the EPU project?

A. Yes. FPL's long-term investment in the EPU project is being implemented by employing a lot of people at a time when jobs matter a great deal. Exhibit TOJ-16 shows that on average, more than 3,400 people are being employed – nearly all in Florida -- throughout 2012 to accomplish the uprate. Exhibit

TOJ-16 also shows that a high level of employment on the EPU project will continue through the first quarter of 2013, with on average nearly 2,000 people being employed to complete the project. This extensive workforce includes thousands of professional, technical, and administrative workers. Employment of these workers represents a large portion of FPL's total anticipated investment in 2012 and 2013 of $1,100 million and $200 million, respectively.

Q. Please describe how the remainder of your testimony is organized.

A. My testimony includes the following sections:

- Project Status and Schedule
- True-Up to Original Cost and Updated Cost Estimate Range
- Long Term Feasibility
- Project Management Internal Controls
- 2012 Actual/Estimated Construction Activities and Costs
- 2013 Projected Construction Activities and Costs

PROJECT STATUS AND SCHEDULE

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

A. In 2012, FPL expects to complete the Engineering Analysis Phase following the Nuclear Regulatory Commission (NRC) approval of the Turkey Point, St. Lucie Unit 1 and St. Lucie Unit 2 EPU License Amendment Requests (LARs). FPL will also complete the Long Lead Procurement and the Engineering

Design Modification phases. The Implementation phase is in full swing, with the planned completion of three outages during 2012 and the final EPU outage in early 2013. FPL has successfully completed five of eight planned EPU outages in the Implementation Phase. Turkey Point Unit 3 is presently in its second (and last) EPU outage and the second (and last) Turkey Point Unit 4 outage is planned to start in November of this year. The second (and last) outage at St. Lucie Unit 2 will begin in August of this year. Additionally, FPL plans to conduct a brief mid-cycle outage at St. Lucie Unit 1 this year, which will be the final EPU outage for that unit.

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

A. FPL must obtain a license amendment to the renewed NRC operating licenses for St. Lucie Unit 1, St. Lucie Unit 2, and Turkey Point Units 3 and 4 in order to operate at the EPU condition. We expect to receive NRC approval of the Turkey Point EPU LAR in late April or early May 2012. For St. Lucie Unit 1, we expect to receive a favorable review from the NRC Advisory Committee on Reactor Safeguards (ACRS) subcommittee by the end of April 2012, and we expect NRC approval no later than July of this year. For St. Lucie Unit 2, we expect a favorable review from the ACRS subcommittee in June and NRC approval in August.

FPL expected to receive its EPU LAR approvals much sooner. However, NRC resource constraints resulted in delays in LAR reviews and approvals. In order to minimize the financial and timing impacts on the project, FPL developed a plan for a 2012 St. Lucie Unit 1 mid-cycle outage. The mid-cycle outage duration is planned to be several days; long enough to change instrumentation set points and other minor modifications necessary for operation in the approved uprate condition. The outage will also allow FPL to implement processes and procedures for operating the plant in the uprate condition. The Turkey Point Unit 3 outage start date was also modified to allow more time for the NRC to approve the Turkey Point EPU LAR and to allow for further completion of pre-outage work.

Q. Do industry-wide developments affect the NRC's review of FPL's EPU LARs?

A. Yes. As discussed in my March 1, 2012 testimony, the earthquake and tsunami in Japan and the earthquake in Virginia have adversely impacted NRC staff resources, and consequently, extended the timeline for the review of FPL's EPU LAR submittals as mentioned above. This is resulting in significant cost and schedule impacts to the EPU Project. Additionally, just prior to the Turkey Point ACRS subcommittee meeting, the NRC raised an issue with the Westinghouse fuel performance model with respect to a non-FPL plant. This industry development required FPL to perform additional LAR engineering activities in support of its Turkey Point and St. Lucie EPU LARs. This issue is now completed with respect to Turkey Point, and FPL expects it to be completed with respect to St. Lucie when the EPU LARs go to the ACRS subcommittees.

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. The project schedule continues to support overall completion in 2013. EPU work on three out of four reactors will be finished by the end of this year, with the fourth completed in March 2013. Exhibit TOJ–17, Extended Power Uprate Project Schedule as of April 23, 2012, presents the EPU Project schedule and the overlapping phases of the work activities. This schedule reflects the outage duration revisions that were discussed in my March 1, 2012 testimony, the decision to change the St. Lucie Unit 2 and the Turkey Point Unit 3 outage start dates, and the addition of the short mid-cycle outage for St. Lucie Unit 1.

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

A. The revisions to the outage start dates provide greater assurance that the NRC will complete the reviews and approvals needed before the upgraded units are placed into service. In the case of Turkey Point, approval of the EPU LAR is needed before Unit 3 can return to service following its final EPU outage. It also allows for the completion of more pre-outage work prior to entering the outage. Finally, such changes allow for FPL to maximize its nuclear fuel usage.

TRUE-UP TO ORIGINAL COST AND UPDATED COST ESTIMATE RANGE

Q. Did FPL prepare a true-up of the total project costs in 2012?

A. Yes. FPL's 2012 True-up to Original (TOR) schedule is included in TOJ-14.

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

A. Yes. Exhibit TOJ-14 includes the 2013 TOR schedules that compare the current projections to FPL's originally filed project costs. The 2013 TOR schedules provide information on the project costs through the end of 2013.

Q. Has FPL updated its total non-binding cost estimate for the project?

A. Yes. Consistent with the Commission's direction in Order No. PSC-09-0783-FOF-EI, FPL has updated its non-binding cost estimate for the EPU project. FPL has developed an updated cost estimate range for the EPU project that reflects increased scope that is necessary to support NRC regulatory requirements, design evolution, and construction and implementation logistics. It also reflects costs associated with schedule changes made primarily to accommodate extended NRC LAR review and approval timeframes. The updated cost estimate range is approximately $2,950 million to $3,150 million, including transmission and carrying costs, as shown on NFR Schedule TOR-2.

Q. Does the stage of the project affect the project cost forecasting process?

A. Yes. As I have testified in earlier years, the progression of project activities each year provides FPL with additional information enabling it to revise its non-binding cost estimate. At the time of FPL's May 2, 2011 filing, which included its last non-binding cost estimate range, the EPU project had completed 36% of total engineering, representing much less information than is currently available at the time of this filing. At the time of this filing, approximately 90% of the EPU engineering is complete. Additionally, in May 2011, only 81 of 209 modification packages had reached the 90% complete stage, as compared to the 206 of 220 modification packages that are currently at the 90% complete stage. Modification packages must reach 90% before detailed construction planning can commence.

Q. What does detailed construction planning include, and how does it affect the preparation of cost estimates?

Detailed construction planning includes engineers actually walking-down the areas of the plant that will be modified to assess exactly how to physically and mechanically implement the final modification design taking into account the actual existing physical configuration of the plant, including the effects on components and equipment that are not part of the system being modified. This process disclosed the need for much more extensive construction efforts than had been previously estimated without the benefit of final modification designs.

Detailed construction planning, including system walkdowns, enables FPL to determine with a much higher degree of precision and specificity the actual steps and sequences of actions needed to physically construct the modification in the plant. This includes figuring out the detailed logistics, identifying and planning for the temporary relocation or permanent removal of any interferences encountered between modified equipment and existing plant systems, quantifying how much of different commodities such as feet of wire, feet of piping and consumables will be required, as well as the task of identifying and engineering plant structural modifications to support the EPU modifications. As a simple example, some of the major generating equipment being installed is a lot larger and heavier than the existing equipment that it replaces. Accordingly, to accommodate the uprate condition the structure of the plant itself needs to be strengthened to support the weight and safely deal with the changed mechanical stresses caused by the larger equipment.

All of this additional implementation work requires additional manhours for engineering, construction and project support, causing the cost estimate to increase. Additionally, the need for an augmented construction organization and infrastructure to support the additional work has been identified and included in the estimate.

Q. **Could the changes to FPL's non-binding cost estimate associated with construction engineering have been determined by FPL at an earlier stage of the project?**

A. No. These construction details, and associated cost estimates, could only be developed once the detailed engineering was substantially completed, which then enabled FPL to determine what work is required in the plant to implement the modifications.

Q. Please describe the process of revising FPL's non-binding cost estimate range.

A. The process to revise FPL's non-binding cost estimate was completed in April 2012. The process to revise FPL's non-binding cost estimate range began with the receipt of the EPC vendor, Bechtel's, Estimate at Completion (EAC) for the Turkey Point EPU work in November of 2011. (The Turkey Point EAC, and FPL's response, was described in my March 1, 2012 testimony.) This was Bechtel's first opportunity to provide an estimate that included detailed construction costs since engineering design was only then approaching 90% on a majority of modifications. Bechtel's EAC was higher than previous estimates, reflecting increased scope that is necessary to support NRC regulatory requirements, design evolution, and construction and implementation logistics.

Q. What did FPL do after it received the Bechtel EAC in November, 2011?

A. In December 2011 through April 2012, FPL performed extensive due diligence on Bechtel's Turkey Point EAC as well as revised estimates for St. Lucie. This included enormous amounts of engineering, corporate staff and executive work to analyze the EAC. In order to better understand and analyze the basis for the EAC, FPL's due diligence included several trips to Bechtel in Frederick, Maryland by FPL senior management and several trips to FPL's headquarters by Bechtel senior management.

Q. What other kind of work did FPL do to review the EAC with Bechtel?

A. FPL worked with Bechtel and High Bridge to perform a detailed review of all inputs and assumptions used in estimating the remaining work at each plant. The detailed review work included three days of lengthy sessions with senior management from FPL and Bechtel. Those sessions built upon the close analyses that FPL had already performed to scrutinize in detail key elements of the cost estimate, including: (i) units of productivity; (ii) quantifications of commodities; (iii) "implied complexity factors" which are an industry standard measure of how complicated work is to perform; (iv) labor rates; and (v) professional rates, among other cost estimate inputs. The focus of these detailed reviews was to validate that the inputs being used in the cost estimating process were not overly conservative.

Q. Did FPL's process of closely scrutinizing the Turkey Point EAC and St. Lucie estimate result in reductions in the cost estimate?

A. Yes. FPL and Bechtel's joint review identified a number of opportunities for efficiencies and process improvements, for example, with respect to how crews are organized to perform certain scopes of work. In total, this process of closely scrutinizing the EAC resulted in an approximately $89 million reduction to the Turkey Point EAC.

Q. Did FPL take further steps to reduce estimated project costs?

A. Yes. After exhausting all available options to optimize the EPU project work and realize potential efficiencies, FPL and Bechtel began negotiations for significant price reductions and concessions, and brought those negotiations to a successful conclusion.

Q. Did you personally seek price reductions and concessions?

A. Yes. I held numerous meetings with Bechtel to negotiate price reductions, the last few of which were also attended by senior management from each company.

Q. What price reductions and concessions did FPL and Bechtel negotiate?

A. FPL and Bechtel agreed to a number of price reductions and concessions that benefit FPL's customers by reducing the estimated cost of the project. These include Bechtel's agreement to:

- Forego its incentive fee - a fee typically paid based on performance, in addition to time and material payments for major construction projects such as the EPU project, and which fee had been provided for in the original contract between FPL and Bechtel;
- Reduce its daily living allowance;
- Reduce its billable rate for Field Non-Manual employees; and
- Waived its escalation of rates.

Further, Bechtel negotiated a wage freeze with its union trade workers and agreed to obtain a reduction on its subcontractor charges.

Q. How much will the price reductions and concessions FPL negotiated benefit customers?

A. FPL estimates that in total these concessions will reduce the project cost by approximately $46 million.

Q. What is the combined effect of the cost reductions from closely scrutinizing the cost estimates and obtaining price reductions and concessions?

A. These efforts produced total cost reductions of $135 million, which represents a 14% reduction to the Engineering and Construction to-go forecast dated March 31, 2012.

Q. After accounting for all the above cost reductions, why is the EPU project still estimated to cost more than estimated last year?

A. The primary cost drivers can generally be described as (i) NRC regulatory requirements and delays, (ii) design evolution, and (iii) construction implementation and logistics.

About $110 million of the project cost estimate increase can be attributed to those modifications that are required to meet NRC requirements, as well as costs associated with outage schedule changes caused by delays in NRC LAR approvals.

About $150 million of the project cost estimate increase can be attributed to design evolution. Design evolution refers to costs associated with the iterative engineering process needed to address issues discovered during engineering design, such as the need for structural upgrades caused by the ultimate weight and dynamic loading of new equipment.

About $220 million of the project cost increase can be attributed to construction implementation and logistics. Construction implementation and logistics refers generally to the issues and related costs that cannot be known until designs are complete (or at the 90% complete stage) and detailed construction planning and plant walkdowns can commence. Costs identified by detailed construction planning (the conversion of design engineering into detailed steps required to complete the scope of work) and plant walkdowns include, for example, the need to construct temporary decking for equipment lay down space and crane/rigging methodology adjustments. Design evolution and construction implementation issues necessarily overlap.

Q. What factor ultimately drives the project cost estimate?

A. Ultimately it is the human effort required to complete the project and the number of people that are required to be employed for that effort that drives the project cost estimate. The increased labor and required infrastructure to manage that labor is the consistent cost driver within each of the above categories. The EPU project is requiring many more activities, which require many more people, and a bigger organization to manage all the work.

As mentioned above, detailed construction planning can only commence when engineering designed modification packages are 90% complete. Then, FPL and its vendors can perform walkdowns and develop subcontractor estimates, labor estimates, security, commodities, logistics, and the oversight structure needed to support the implementation activities. As discussed earlier, often, new construction "scope" is revealed that could not have been known prior to detailed construction planning, and the time and number of personnel needed to plan for and execute the construction activities for a particular modification must be increased.

Q. Please provide an example of how performing detailed construction planning, after completion of the design engineering for a modification, results in increased estimated costs.

A. For example, consider the PTN Normal Containment Coolers (NCCs) modification. A NCC cools the air inside the reactor containment building during normal plant operations. The new NCCs are much bigger and heavier than the original coolers. This means significant structural steel reinforcement is needed to bear their weight. This is an example of the iterative design effects of modifications that increase scope.

Then, from the detailed constructability walkdowns in the reactor containment building, it was determined that the lay-down space inside the reactor containment was not sufficient. That means we needed to install temporary steel decking inside the plant simply to provide the lay-down space for equipment necessary to implement the NCC work. Walkdowns also showed that interferences must be removed in order to install the new NCC subcomponents. Additionally, detailed work planning identified that a temporary supplemental crane system had to be installed inside containment to support the large number of lifts required to implement the work. All of these issues have contributed to the increased complexity – and cost – of the NCC replacement scope.

Q. Are there other examples of this type of increased construction complexity which resulted in increases in the cost estimate?

A. Yes. Additional examples are attached as Exhibit TOJ-18.

Q. What is the basis for the non-binding cost estimate range?

A. The low end of the non-binding cost estimate range is based on the project forecast as of March 31, 2012 and includes allowances for known pending changes. The high end of the non-binding cost estimate range starts with the low end and adds contingency for scope growth and discovery for the remaining outages based on current outage performance.

LONG TERM FEASIBILITY

Q. What total project cost did FPL use for purposes of the 2012 economic feasibility analysis?

A. FPL performed its feasibility analysis with an estimated going forward project cost figure of $1,590 million, which includes transmission and carrying costs. This reflects FPL's project manage-to estimate of $3,050 million approved in mid-April 2012 less sunk costs as of year-end 2011, consistent with the treatment of sunk costs provided for in Commission Order No. PSC-09-0783-FOF-EI and Order No. PSC-11-0547-FOF-EI. FPL selected the $3,050 million manage-to estimate as the basis for the feasibility analysis because it was more conservative than the project forecast at the time of the analysis.

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 490 MWe for feasibility analysis purposes.

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 completing the Uprate project, demonstrating net savings in 6 out of 7 analyzed scenarios of fuel costs and environmental compliance costs.

Q. Are there other system benefits provided by the EPU project?

A. Yes. As described and supported by FPL Witness Sim, FPL expects that the EPU project will:

- Provide estimated fossil fuel cost savings for customers of approximately $114 million in the first full year of operation;
- Provide estimated fossil fuel cost savings for FPL's customers over the life of the plants of approximately $3.8 billion (nominal);
- Diversify FPL's fuel sources by decreasing FPL's reliance on natural gas and foreign oil. Addition of the EPU project will reduce reliance on natural gas by 3% beginning in the first full year of operation, providing an important hedge against volatile natural gas prices and

helping to reduce reliance on Florida's limited natural gas transportation infrastructure;

- Provide a total amount of energy that is equivalent to the usage of 311,578 residential customers each year;
- Reduce annual fossil fuel usage by the equivalent of 6 million barrels of oil or 41 million mmBTU of natural gas annually;
- Reduce system CO_2 emissions by an estimated 32 million tons over the life of the plants; and
- Provide generation in the Southeast portion of FPL's service area, helping to mitigate against a growing generation-load imbalance.

Q. Please describe the benefits to the Southeast portion of FPL's service area in more detail.

A. The EPU project will contribute to grid stability by producing power where it is consumed. Growth in electrical load in the Southeast area within FPL's service area means that FPL must either add new generation to that area or rely on transmission lines to import the needed energy. All else equal, adding locally-sited generation contributes to grid stability and is more reliable than relying on transmission lines that cover long distances and are susceptible to interferences from storms or other issues beyond FPL's control that could result in outages. When generation is sited closer to where it is consumed, fewer people will be affected when storms take out transmission lines. Additionally, increasing generation at the Turkey Point site reduces system transmission line losses, meaning more power is available for customers to use.

Q. Has FPL examined other aspects of EPU project feasibility in addition to economics?

A. Yes. FPL continuously assesses the financial, technical, and regulatory aspects of the EPU project, and the project remains feasible.

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

A. Yes. In fact, the project is fast approaching completion.

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 adequate amounts of capital will be obtained to complete the project.

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

A. Yes. FPL has completed the state licensing/permitting process. FPL has submitted all necessary LARs to the NRC and expects final approval in 2012.

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 earthquake and tsunami and the Virginia earthquake. FPL monitors these and other factors. None of these issues has caused the project to cease being feasible.

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

A. No. FPL's economic feasibility analysis sponsored by FPL Witness Dr. Sim is being provided in satisfaction of Rule 25-6.0423(5)(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.

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, 2012 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 2012.

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 2012 actual/estimated and 2013 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 2012, 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 2011. FPL anticipates that this audit will be completed this summer. An internal audit will be conducted next year to review 2012 expenditures.

2012 ACTUAL/ESTIMATED CONSTRUCTION ACTIVITIES AND COSTS

Q. Please summarize the activities planned for and being implemented in 2012.

A. In 2012, FPL is supporting the NRC's final review and approval of the LARs. The Long Lead Equipment procurement phase is nearing completion as milestone payments are made and necessary equipment is delivered to support the outages in 2012. The Engineering Design Modification Phase is nearly complete with the EPC vendor completing the modification packages and supporting construction planning activities for the outages. The Implementation Phase is in full swing with the planning and execution of the major construction activities during the 2012 outages.

Q. Please describe the Engineering Design and Implementation work that will occur at St. Lucie.

A. In 2012, the EPU project will:

- Complete remaining engineering design work to support detailed construction planning for the implementation of modifications during the final St. Lucie EPU outages;
- Complete detailed construction and logistics planning required to perform the modifications during the final St. Lucie EPU outages;
- Complete the outage at St. Lucie Unit 1 (outage was completed on April 21, 2012), which includes the installation of the following major equipment:
    - Containment Mini-Purge System
    - High Pressure Turbine
    - Moisture Separator Reheater
    - Low Pressure Turbine

    - Main Generator Stator Rewind
    - Main Generator Rotor
    - Feedwater heaters #5A & B
    - Leading Edge Flow Meter
    - Heater Drain Pumps and Motors
    - Main Feedwater Pump
    - Heater Drain Control Valves
    - Main Transformer Coolers;
- Execute the mid-cycle outage at St. Lucie Unit 1 upon approval of the EPU LAR, which will provide 129 MWe when the unit is returned to service;
- Execute the final outage at St. Lucie Unit 2 beginning in August 2012 and ending in November 2012, which includes installation of the following major equipment and is expected to add 84 MWe to the 31 MWe already achieved (for a total of 115 MWe from this unit) when the unit is returned to service:
    - High Pressure Turbine
    - Moisture Separator Reheaters
    - Feedwater Heaters #5A & B
    - Feedwater Heaters #4A & B
    - Leading Edge Flow Meter
    - Heater Drain Pumps
    - Main Feedwater Pump

- Heater Drain Control Valves
- Isophase Bus Duct Cooling System
- Main Transformer

(A diagram of this outage work is attached as Exhibit TOJ-19).

Q. Please describe the Engineering Design and Implementation work that will occur at Turkey Point.

A. In 2012, the EPU project will:

- Complete remaining engineering design work to support detailed construction planning for the implementation of modifications during the final Turkey Point EPU outages;
- Complete detailed construction and logistics planning required to perform the modifications during the final Turkey Point EPU outages;
- Execute the final outage at Turkey Point Unit 3 beginning in February 2012 and ending in August 2012, which includes installation of the following major equipment and will provide an additional 123 MWe from this unit when the unit is returned to service:
    - Normal Containment Coolers
    - High Pressure Turbine Modifications
    - Main Generator Rotor
    - Moisture Separator Reheaters
    - Main Condenser
    - Condensate Pumps and Motors
    - Turbine Plant Cooling Water heat Exchanger

- Main Feedwater Pumps Rotating Elements
- Feedwater heaters #5A & B
- Feedwater heaters #6A & B
- Isophase Bus Duct System

(A diagram of this outage work is attached as Exhibit TOJ-20. Pictures of the Turkey Point site taken during this outage are also attached as Exhibit TOJ-21.)

- Begin final outage at Turkey Point Unit 4 in November 2012 (to be completed in March 2013), which will add 123 MWe when it is returned to service.

Q. Did FPL project its 2012 EPU costs for these types of activities in 2011?

A. Yes. FPL prepared and filed a projection of 2012 costs in Docket No. 110009-EI.

Q. Has FPL trued-up these projections to develop 2012 Actual/Estimated costs?

A. Yes. Exhibit TOJ-14 presents FPL's 2012 Actual/Estimated costs.

Q. Please describe how FPL developed its 2012 Actual/Estimated costs.

A. Actual 2012 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.

The estimated project costs were developed from Project Controls forecasts derived from the best available information for all known project activities in 2012. Included in the forecasts are the vendor long lead material contracts that have scheduled milestone payments in 2012. 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. What types of costs does FPL plan to incur for the Uprate project in 2012?

A. As indicated in Exhibit TOJ-14, Schedule Actual/Estimated (AE) – 4 and AE-6, and summarized in Exhibit TOJ-23, EPU Actual/Estimated 2012 Summary Costs Tables, Tables 1 through 9, costs were incurred in the following categories: Licensing; Engineering & Design; Permitting; Project Management; Power Block Engineering, Procurement, etc.; Non-Power Block Engineering, Procurement, etc.; EPU Recoverable O&M; and Transmission Capital and Recoverable O&M. Table 1 is a summary of each of the categories showing the 2012 actual/estimated amounts. The amounts shown in the exhibit are slightly different than the NFR schedules as footnoted on the exhibit.

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

A. For the period ending December 31, 2012, License Application costs are estimated to be $26,071,019 as shown on Table 2 of Exhibit TOJ-23. These License Application costs consist primarily of payments to vendors for support in responding to NRC Requests for Additional Information as necessary in 2012, and NRC fees. This is approximately $20.8 million more than projected due to increased scope, additional engineering analyses and fees required by the NRC for completing the licensing effort.

Q. Please describe the 2012 activities in the Engineering and Design category.

A. For the period ending December 31, 2012, Engineering and Design costs are estimated to be $24,666,015 as shown on Table 3 of Exhibit TOJ-23. 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, the EPC for the EPU Project, and other vendors. This is approximately $13.6 million more than projected due to the need for additional resources to support the increased scope and complexity for design engineering.

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

A. For the period ending December 31, 2012, Permitting costs are estimated to be $0 as shown on Table 4 of Exhibit TOJ-23.

Q. Please describe the 2012 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, 2012, Project Management costs are estimated to be $52,273,140 as shown on Table 5 of Exhibit TOJ-23. 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 $25.9 million more than projected due to additional support needed for the increased number and types of resources and implementation of the EPU outages scheduled for 2012.

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 estimated to be $954,929,052 as shown on Table 6 of

Exhibit TOJ-23. This is approximately $232.3 million more than projected. The primary drivers include the deferral of long lead equipment payments from 2011 into 2012 (approximately $30 million), increased Siemens labor costs (approximately $50 million), increased EPC labor and management costs (approximately $251 million), increased Station Indirect Outage costs (approximately $6 million), and the increased infrastructure (approximately $98 million) – all of which is required to implement the much more complex construction effort as determined by the completion of modification design engineering and detailed construction planning. These variances, however, are offset by less than planned turbine generator equipment costs (approximately $11 million), reductions to scope and contingency (approximately $189 million), and certain accounting adjustments (approximately $3 million).

This amount is primarily for the development of the engineering design modification packages and for the implementation of the scheduled work for the four outages scheduled for 2012. 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 and other vendors. This amount also includes the next level of detailed implementation activities, including the development and issuance of step-by-step work instructions for the construction and integration of the modifications into the physical plant structures and systems. The second part of this phase is the actual, physical execution of the construction work and management of the logistics in the plant, most of which is occurring in the scheduled 2012 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 Control Room Ventilation system modification at Turkey Point, which is required to satisfy the NRC's Alternative Source Term license requirements. Additionally, a portion of the turbine controls were replaced at the St. Lucie units while those units were on-line.

Procurement costs include the purchase of long lead equipment items and progress payments to manufacturing vendors. FPL is continuing to make required milestone payments on previously executed contracts for the procurement of major equipment.

Q. Please describe the 2012 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 $1,078,425 as shown on Table 7 of Exhibit TOJ-23.

This is approximately $0.6 million more than projected due to the additional support needed for the increased number of resources required by the constructability complexity for the EPU outages in 2012.

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.

There are fabrication areas created to pre-fabricate piping and valves, which 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 of field activities during the outage. Warehouses are used to store and stage delivered materials for the EPU project prior to installation and to provide areas for the training and qualification of craft labor. A site training and qualification area is necessary to ensure the sites have 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.

Q. **Please describe the 2012 actual/estimated recoverable O&M costs.**

A. Actual/Estimated recoverable O&M costs for the EPU project in 2012 include $15,283,333 for EPU, shown on Table 8 of Exhibit TOJ-23, and $2,606 for

Transmission, as shown on Table 9 of Exhibit TOJ-23. Recoverable O&M primarily consists of costs for performing work activities that do not meet FPL's capitalization criteria and an estimate of obsolete materials that will be expensed as a result of modifications completed in 2012. This is approximately $9.7 million more due to a determination that certain activities did not meet FPL's capitalization criteria.

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

A For the period ending December 31, 2012, Transmission costs are estimated to be $27,387,533 as shown on Table 9 of Exhibit TOJ-23. 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 $.1 million more than projected due to some transmission outage work accelerated into 2012 and some deferred from 2011 into 2012 due to line and switchyard availability.

Q. **Please describe the equipment going into service in 2012.**

A. Exhibit TOJ-22, 2011 Extended Power Uprate Project Work Activities, is a listing by outage of major 2012 work activities for PSL Unit 1, PSL Unit 2, and PTN Unit 3. To the extent the work activities are subject to capitalization as units of property and the modification is completed in 2012, the plant components will be placed into service. The items going into service include, but are not limited to: steam turbines, moisture separator reheaters, feedwater heaters, normal containment coolers, main generators, feedwater pumps, condensate pumps, large electric motors, and main power transformers –

which are required to produce the 367 MWe that the EPU project will be delivering to customers by year end.

Q. Are the 2012 actual/estimated costs presented in your testimony "separate and apart" from other nuclear plant expenditures?

A. Yes, the 2012 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, 2012, through engineering analyses FPL has identified the major components and systems that must be modified or replaced to safely uprate the units and only those modifications are included in the EPU project. 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 2012 EPU costs reasonable?

A. Yes. The majority of FPL's 2012 expenditures are for (i) payments to long lead equipment manufacturers; (ii) payments to the competitively bid EPC vendor and other vendors awarded some of the EPC scope; (iii) payments to original equipment manufacturers for LAR engineering analyses; and (iv) the implementation costs, including the planning, scheduling, and execution associated with four EPU outages.

Careful vendor oversight, continued use of sub-contracting and 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 2012 expenditures are reasonable.

2013 PROJECTED CONSTRUCTION ACTIVITIES AND COSTS

Q. Please summarize the construction activities projected for 2013.

A. In 2013 FPL will complete the EPU project, including related project close-out tasks. The EPU LAR Engineering Analysis phase will have been completed and all LAR approvals will have been received. The Long Lead Equipment Procurement Phase will be completed, including receipt of equipment for the modifications in the 2012-2013 Turkey Point Unit 4 outage. FPL will complete execution of the Turkey Point Unit 4 EPU outage, including extensive testing and systematic turnover to operations. Exhibit TOJ-24, 2013 Extended Power Uprate Work Activities, includes a description of the work activities for this outage.

Q. Please describe how FPL developed its projections of 2013 costs for its NFRs.

A. The 2013 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 2013?

A. As indicated in Exhibit TOJ-14, Schedule Projection (P) – 4 and P-6, and summarized in Exhibit TOJ-25, EPU Projected 2013 Summary Costs Tables, Tables 1 through 9, costs will be incurred in the following categories: Engineering & Design; Project Management; Power Block Engineering, Procurement, etc.; EPU Recoverable O&M; and Transmission Capital and Recoverable O&M. Table 1 is a summary of each of the categories showing the 2013 projected amounts. The amounts shown in the exhibit are slightly different than the NFR schedules as footnoted on the exhibit.

Q. Please describe the activities in the License Application category for 2013.

A. For the period ending December 31, 2013, License Application costs are projected to be $0 as shown on Table 2 of Exhibit TOJ-25.

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

A. For the period ending December 31, 2013, Engineering and Design costs are projected to be $5,942,487 as shown on Table 3 of Exhibit TOJ-25. The amount consists primarily of FPL engineering activities to support implementation of the engineered modification packages.

Q. Please describe the activities in the Permitting category for 2013.

A. For the period ending December 31, 2013, Permitting costs are projected to be $0 as shown on Table 4 of Exhibit TOJ-25.

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, 2013, Project Management costs are projected to be $15,793,184 as shown on Table 3 of Exhibit TOJ-25. This category includes the project management costs associated with the oversight and management of the implementation of modifications during the planned Turkey Point Unit 4 outage scheduled to complete in early 2013. 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 2013 activities in the Power Block Engineering, Procurement, Etc. category.

A. For the period ending December 31, 2013, Power Block Engineering and Procurement costs are projected to be $174,421,527, as shown on Table 6 of Exhibit TOJ-25. This amount consists of final milestone payments to be made to manufacturers of long lead materials and payments to be made to the EPC and other vendors for the work associated with the implementation of the engineered modification packages in the Turkey Point Unit 4 planned 2013 outage. This includes final known payments to vendors following installation and testing of the equipment supplied for the Uprates completed through 2013.

The Turkey Point Unit 4 outage that will be completed in 2013 is the final EPU outage. It will add approximately 123 MWe for the benefit of FPL customers. Some of the modifications planned are: main turbine upgrades, main generator rewind and rotor replacement, moisture separator reheater replacements, main condenser replacement, condensate pump and motor replacements, feedwater heater replacements, and the feedwater heater drain piping replacement. This outage is scheduled to be completed early in 2013 followed by project closeout.

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

A. For the period ending December 31, 2013, Non-Power Block Engineering costs are estimated to be $0 as shown on Table 7 of Exhibit TOJ-25.

Q. Please describe the 2013 projected recoverable O&M costs.

A. Projected recoverable O&M costs for the EPU project in 2013 total $5,167,618 as shown on Table 8 of Exhibit TOJ-25. 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 and project closeout. Additionally, required EPU activities that do not meet FPL's capitalization policy are included.

Q. Please describe the 2013 activities in the Transmission category.

A. For the period ending December 31, 2013, Transmission costs are projected to be $250,000 as shown on Table 9 of Exhibit TOJ-25.

Q. Please describe the items going into service in 2013.

A. Exhibit TOJ-24, Extended Power Uprate Project Work Activities for 2013, is a listing of equipment and control devices that are planned for installation and are planned to be placed into service in 2013. This list includes 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 2013 cost projections presented in your testimony "separate and apart" from other nuclear plant expenditures?

A. Yes. The 2013 cost projections presented are "separate and apart" from other nuclear plant expenditures. As explained earlier in my testimony, 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.

Q. Are FPL's projected 2013 EPU costs reasonable?

A. Yes. FPL's projected 2013 costs reflect the remaining implementation work that is planned to occur in that year, the large number of systems going into service, and project closeout costs. Project staffing levels, including vendor staffing, will be adjusted to support the modification package engineering design, implementation, outage support and project closeout. The majority of FPL's costs will reflect final payments on contracts introduced and reviewed in prior proceedings. Continued careful vendor oversight as the project reaches conclusion and the application of the robust internal schedule and cost controls and internal management processes, all demonstrate that FPL's projected 2013 expenditures are reasonable.

Q. Please list the exhibits attached to this testimony.

A. I am sponsoring or co-sponsoring the following exhibits:

- Exhibit TOJ-14 consists of 2012 AE Schedules, 2013 P Schedules, and 2013 TOR Schedules. These Nuclear Filing Requirement (NFR) Schedules contain a table of contents listing the schedules that are sponsored and co-sponsored by FPL Witness Powers and me, respectively.
- TOJ-15, 2012 EPU Project Benefits at a Glance
- TOJ-16, EPU Florida Workforce Summary
- TOJ-17, Extended Power Uprate Project Schedule as of April 23, 2012
- TOJ-18, Examples of Design, Implementation and Construction Complexity
- TOJ-19, St. Lucie Unit 2 2012 EPU Scope
- TOJ-20, Turkey Point Unit 3 2012 EPU Scope
- TOJ-21, Turkey Point Unit 3 2012 EPU Outage Construction Work
- TOJ-22, 2012 EPU Project Work Activities
- TOJ-23, EPU Actual/Estimated 2012 Summary Cost Tables
- TOJ-24, 2013 EPU Project Work Activities
- TOJ-25, EPU Projected 2013 Summary Cost Tables

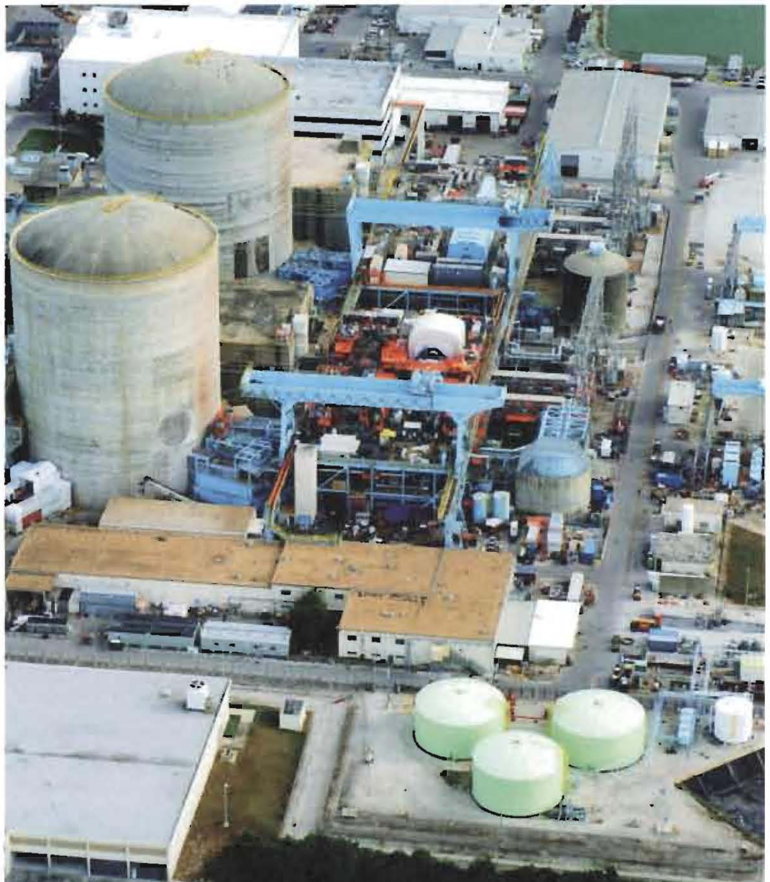
Q. Does this conclude your testimony?

A. Yes.

TOJ-14 is in the Nuclear Filing Requirements Book

2012 Extended Power Uprates (EPU) Project Benefits at a Glance

FPL



St. Lucie Nuclear Plant during 2012 EPU outage. By the end of 2012, 367 megawatts of new, clean, reliable EPU nuclear power will be providing service to customers.

PROJECTED FIRST YEAR FOSSIL FUEL SAVINGS FOR CUSTOMERS

$114 million

PROJECTED LIFETIME FOSSIL FUEL SAVINGS FOR CUSTOMERS

$3.8 billion

ENOUGH ENERGY TO POWER

311,578

customer homes without burning coal, natural gas or foreign oil

ECONOMIC BOOST

More than 3,400

people employed on average during 2012

FEWER GREENHOUSE GAS EMISSIONS

CO_2 reduction of 32 million tons

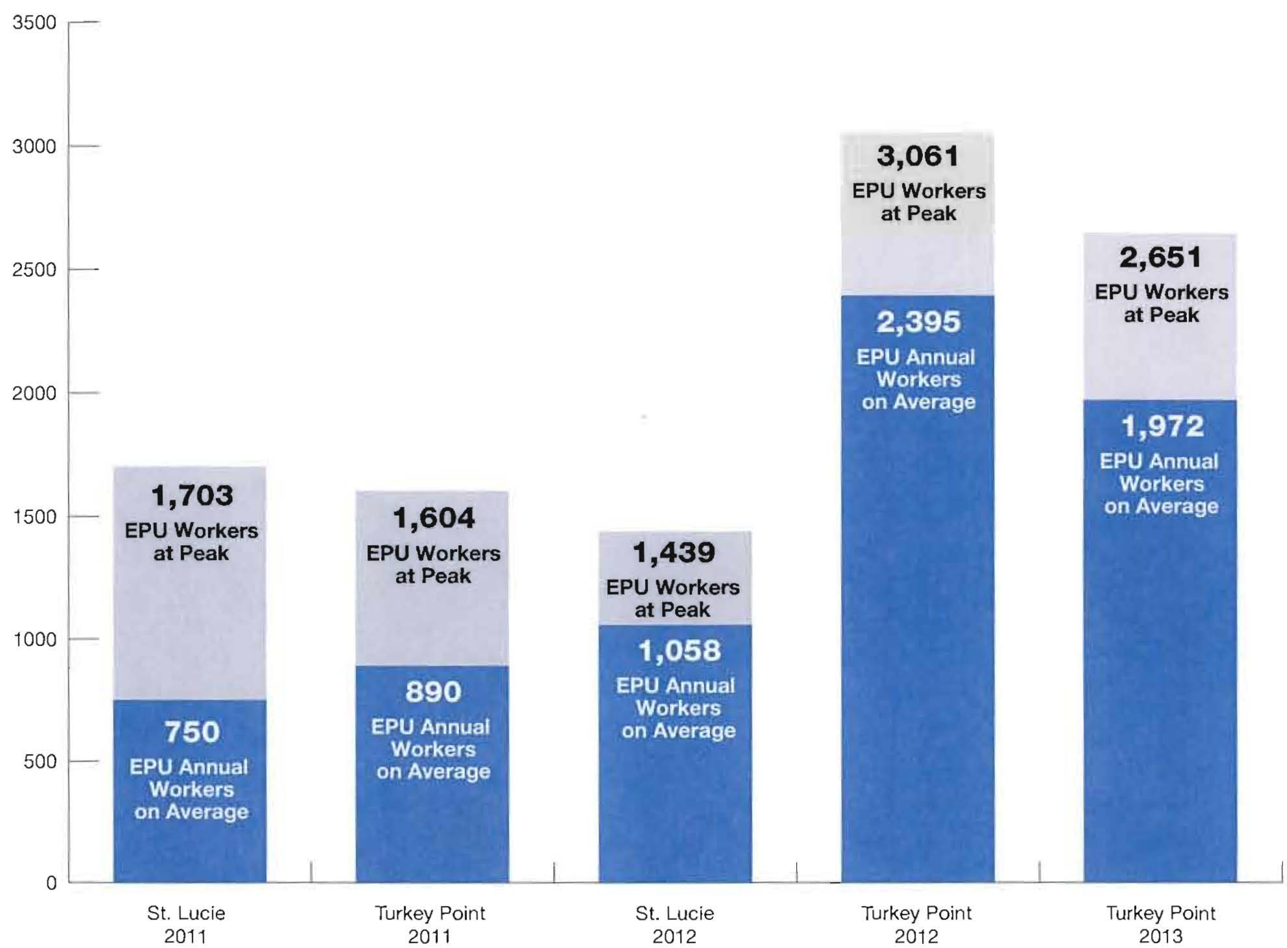
U.S. EPA annual equivalent of removing more than 5 million cars from the road

Figures above are based on April 2012 feasibility analysis and EPU project employment data.

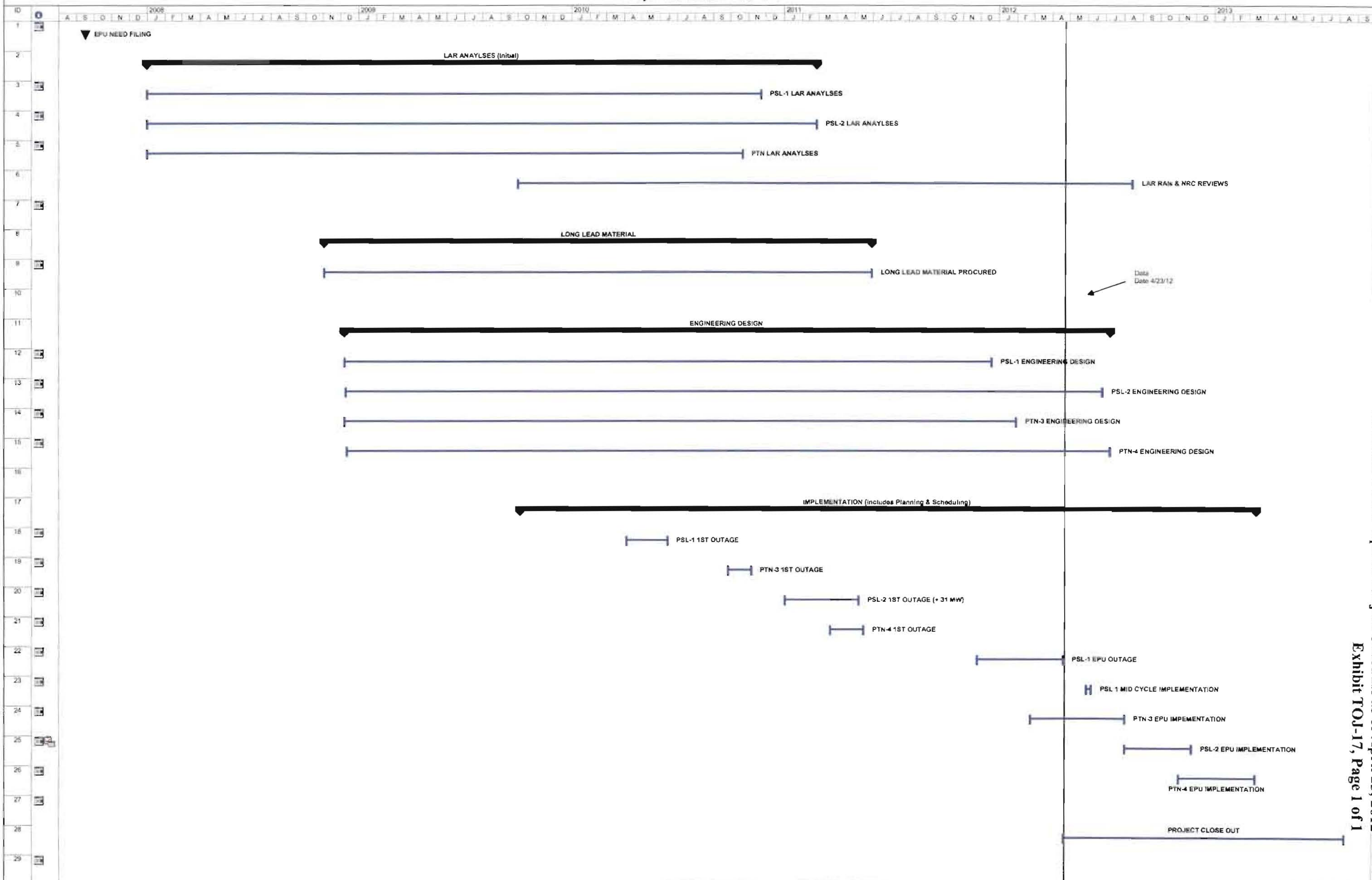
Docket No. 120009-EI
EPU Project Benefits at a Glance
Exhibit TOJ-15, Page 1 of 1

EPU Workforce Summary

It takes thousands of highly skilled workers to implement the EPU Project



EPU Project Schedule Overview



As of 01/18/2012

Docket No. 120009-EI
Extended Power Uprate Project Schedule as of April 23, 2012
Exhibit TOJ-17, Page 1 of 1

Examples of EPU Complexity that Drive 2012 EPU Non-Binding Cost Estimate Increase

Ultimately, the human effort required to perform such a complex project is the primary cost driver.

As the design engineering progresses, discoveries are made that require additional engineering scope and man-hours to solve complex issues. In addition, as the modifications achieve 90% completion, this allows for detailed construction planning which reveals a much more extensive effort and workforce is necessary to effectively integrate and implement the extensive modifications; much more than was known when less engineering was complete. What follows are actual examples of specific challenges faced in design, implementation and constructability. Some examples could fit into more than one category.

Design Complexity - The complexity of the EPU design has increased due to the discovery of design issues during the design process. These examples required additional engineering man-hours to complete the design, which resulted in increased engineering costs and longer engineering schedule durations. Examples of increased design complexity include:

- **The PTN Control Room Emergency Ventilation System (CREVS) modification** was not included in the original scope. The initial Control Room Habitability modifications only required the installation of Sump pH Control Modification Sodium Tetraborate Baskets and removal of the Emergency Containment Filters. The need for CREVS was identified during the Alternatative Source Term (AST) license amendment request engineering. The new modification included a complex replacement and redesign of supports associated with the CREVS fans and relocation of existing intakes. Relocation of existing intakes required additional missile protection design to meet safety related design requirements.

- **The PSL Containment Spray Flow modification** required several analyses, calculations and evaluations by multiple entities as the containment spray system is intertwined with several other primary systems and it affects structures and components of the Reactor Coolant System. Due to the complexity of the containment spray system and the design objective to minimize the physical impacts of this modification, several design iterations were required to finalize the design modification.

- **The PTN feedwater heater replacement modification** includes replacing the feedwater heaters and associated piping. During the detailed design phase, the turbine building was analyzed and found to require additional structural modifications to accommodate installation of the new, larger feedwater heaters. With these structural modifications an overall turbine building seismic fragility model was developed to ensure the additional supports and EPU turbine building was structurally adequate. Turbine building modifications were also required for the moisture separator reheater (MSR) replacement.

- **The PSL Hot Leg Injection modification** had to be changed from an electrical modification to a mechanical modification due to the system's important safety functions, its relationship with other critical systems, and the relative complexity of the system being much greater than other systems.

- **The PTN Turbine Digital Controls Upgrade** includes installation of a new turbine control system. During the detailed design phase, it was determined that existing electrical cable raceways and conduits were not adequate for the new digital controls. Accordingly, new electrical cable raceways, conduits, and associated supports would be required for cable routing. Additionally, the turbine digital control system required a complex factory acceptance test and several design iterations to ensure reliability.

- **The PSL Steam Bypass Valves** were modified to replace the existing valve trims with new valve trims that have less resistance and thus will allow greater flow required for EPU. While this concept minimized the physical modification required, it increased the engineering effort due to the constraints of the existing valve bodies and the complexity of the design functions associated with these valves.

- **The PTN Moisture Separator Reheater Replacement** includes replacement of four MSRs per unit and installation of new instrumentation level standpipes. During design, it was determined that a MSR drain tank would be required to mitigate a two phase flow issue and lack of drainage capability of the existing system (heater drain tank size). The new MSR drain tank would require digital level controls and with the increased overall height of the new MSRs, crossover piping modifications with reheat stop valve relocation was required. The additional weight of the MSRs with the new drain tank required extensive turbine structural steel analyses and modifications. This additional equipment weight was also a factor in having to revise the building seismic fragility analysis.

Implementation Complexity - Logistical complications and additional implementation activities are identified based on the final design modification packages, prior to commencing implementation. Examples of increased implementation complexity include:

- **The new PTN Normal Containment Coolers** (NCCs) are substantially more robust (heavier) in design than the original coolers, which requires significant structural steel reinforcement. It was determined that adequate lay-down space inside containment is not available, which has resulted in the need for temporary cavity decking to provide the lay-down space necessary to implement the NCC work. Interferences must be removed to facilitate installation of the new NCC subcomponents. A temporary supplemental crane system has been installed inside containment to support the large number of lifts required to implement the work. All of these issues have contributed to the increased complexity of the NCC replacement scope.

- **Work inside the turbine building itself is a challenge**. At PSL, the bulk of the EPC contractor's implementation scope and essentially all of the turbine generator contractor's implementation scope is located in the turbine building. Both of these contractors needed staging areas for existing and new components, work space for scaffolding, tenting, tooling, equipment, and personnel, and use of the turbine gantry crane. These logistical complexities were further complicated by the technical requirements of the heavy load analysis which restricted movement of major components. In addition, large areas of the turbine building were evacuated for personnel safety during lifting and movement of the large components.

- **The PTN Condenser Replacement** includes replacing large, heavy tube bundles. This work must be accomplished by removing adjacent interferences and pulling out the existing tube bundles and installing the new tube bundles in the horizontal direction. The original concept was to perform this work using a large mobile crane. However, space limitations and underground piping made the use of a mobile crane infeasible. Once the detailed design was complete and size and weight of the new tube bundles was determined, the construction team developed a plan for erecting a temporary gantry crane that minimizes interference removal and uses specialty micro piles to avoid impacting buried piping. In addition, when the temporary condenser gantry crane lift system is in service, the turbine gantry crane is required to be out of service since both cranes share a common supporting crane rail. This complication requires additional crane scheduling coordination.

- **The PSL Digital Electro-Hydraulic and Electrical Bus Margin modification** included many complicated wiring changes, determinations, and terminations that were much more complex than originally envisioned.

- **At PTN, the major work scope is replacing components on the Turbine Deck**. Siemens, the Turbine Generator original equipment manufacturer implementation contractor will perform the High Pressure Turbine upgrade, High Lift modification, and Main Generator upgrade. Bechtel, the EPC contractor will replace Feedwater Heaters 5 & 6, replace four Moisture Separator Reheaters, install the new Electro Hydraulic Controls (EHC) system, and implement the Gland Steam modification. These activities are complicated by usage of a single Turbine Gantry Crane, common lay-down spaces and work spaces, which require detailed coordination between all contractors involved. Due to the limited availability of the turbine gantry crane, a large tower crane and several small lift cranes have been temporarily installed which provide increased capability to perform lifting activities simultaneously but also require detailed coordination. Further complicating the turbine deck scope is the heavy load analysis which restricts movement of major components due to regulatory requirements. In addition, there are several new systems/components being installed by the EPC contractor that are in close proximity to the turbine generator contractor and thus require greater coordination (e.g., the HP turbine, EHC system, and Gland Steam system).

- **The PTN Spent Fuel Pool Cooling system upgrade** includes installation of a new heat exchanger on a new platform in a very congested area. Numerous interferences had to be removed and redesigned to install the new cooling system while keeping the original system in service.

Constructability Complexity – Constructability issues affect implementation productivity and are discovered during the implementation of the required modifications. Examples of constructability issues include:

- **The existing PSL Unit 1 electrical cable trays** are covered with a flame retardant material called "Flamemastic" which contains some asbestos materials. The EPC contractor is not licensed to work with asbestos containing materials. Therefore, another contractor had to be engaged to attach new conduits and pull new cables in these cable trays. These work activities were coordinated with the related activities of the EPC to complete implementation of these modifications.

- **The PTN Control Rooms** require special processes, procedures, risk evaluations, and look-ahead activities to permit breaching the control room envelop. These precautions are based on operating restrictions placed on both units during a boundary breach. There are 19 separate breaches required to install the required cables into the control room. Each control room envelop breach must be scheduled well in advance and is subject to schedule impacts due to emergent plant issues, thereby affecting craft productivity.

- **During PSL Unit 1 implementation**, numerous components were inspected to validate assumptions for use at EPU conditions. Upon inspection, several temperature control valves required for proper heat up rates on the MSRs required unplanned modifications, which required additional resources to complete implementation.

- **The PTN Spent Fuel Pool Cooling system upgrade** is located in an extremely congested area within the radiation controlled area which required removal of interferences to permit installation while keeping the original system in service. Detailed coordination between operations personnel, the engineers, and the constructors is required to safely resolve these interferences.

- **During implementation of the PSL Safety Injection Tank Requalification modification**, the final piping design identified a dozen new supports required in the crowded pressurizer cubicle located inside the reactor containment building. Because this work was near critical path, resources were added to complete implementation in a timely manner.

- **The PTN Normal Containment Coolers** are located inside the reactor containment building. The new cooler components are substantially more robust than the existing components and therefore require significant structure modifications to support the increased weight. The final support design identified numerous changes to the structural modifications. The work is critical path to the ongoing outage and requires more resources than originally estimated to complete the implementation.

- **During the implementation phase of the PSL Main Steam Isolation Valve modification**, additional control room indication and alarms were added to the design, and a dry air purge system was also required and incorporated into the design. This new scope required additional resources to complete implementation.

- **PTN has lead based paint and asbestos insulation that must be abated** prior to demolition of existing systems, structures, and components and installation of the new equipment required for EPU. These abatement activities require specially trained personnel and sufficient schedule duration to safely complete the work.

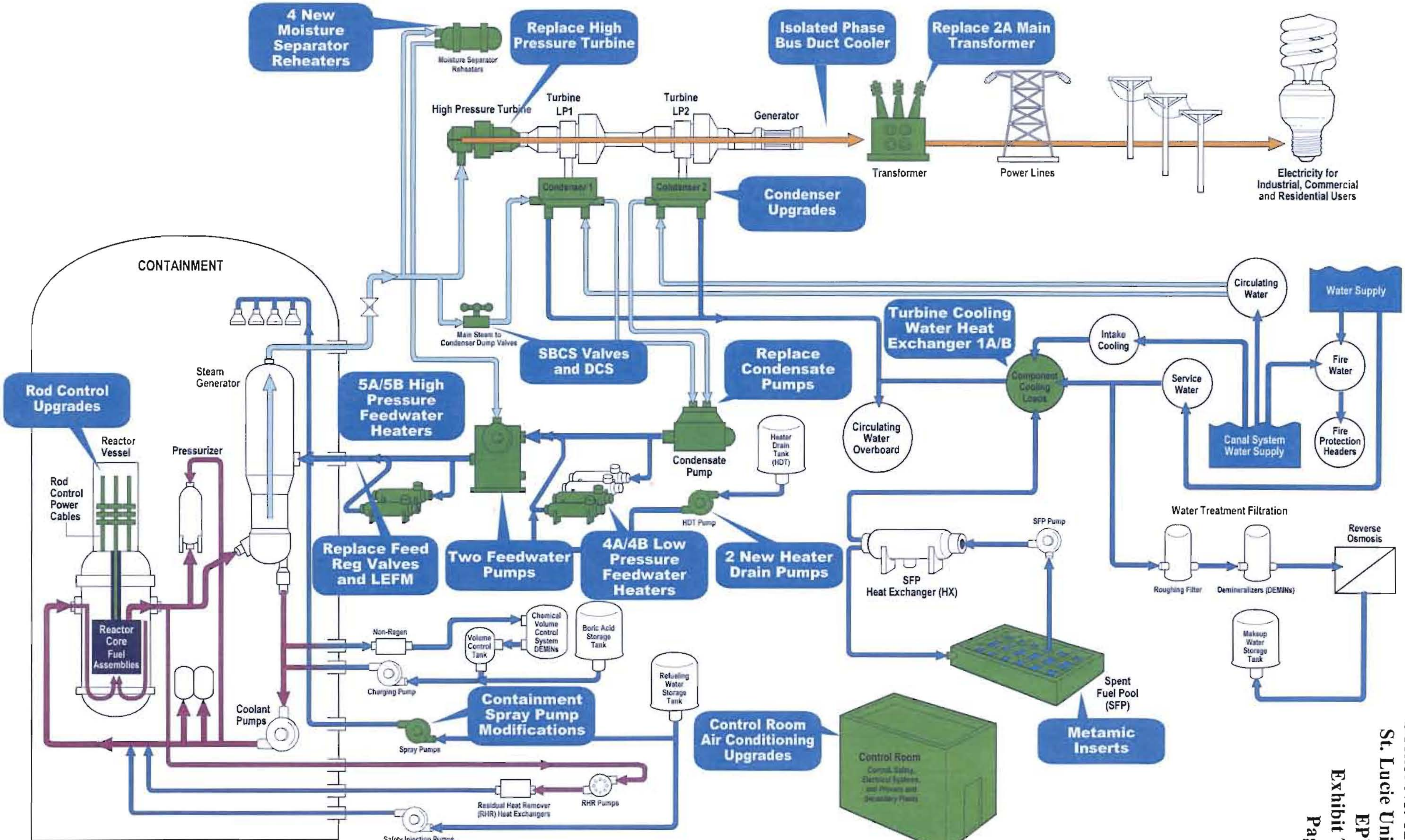
- **The PSL Isolated Phase Bus Duct installation** was complicated by anomalies in the concrete floor. Several attempts were made to shim sections of the duct work. The final resolution was to level the floor thus requiring additional resources to complete implementation.

- **The as built water coolers for the PSL Isolated Phase Bus Duct** could not be installed after the duct work was assembled because of restriction of flanges to ductwork. The cooler flange connections were replaced with threaded nipples requiring additional resources to complete implementation.

- **A counter-bore was required to achieve proper fit-up between the existing PSL plant piping and the new main Feedwater pumps.** In addition, the complexity of adjusting the adjusting flow control instrumentation to correct balance was more complex than anticipated and had a significant impact on tuning the pump seal cooling water flow, thus requiring additional resources to complete implementation.

- **During implementation of the large bore pipe supports for the PSL main steam, condensate, and feed water piping**, there was significant discovery that required more engineering and construction resources than estimated to complete implementation.

St. Lucie Unit 2 2012 EPU Scope



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EPU Scope
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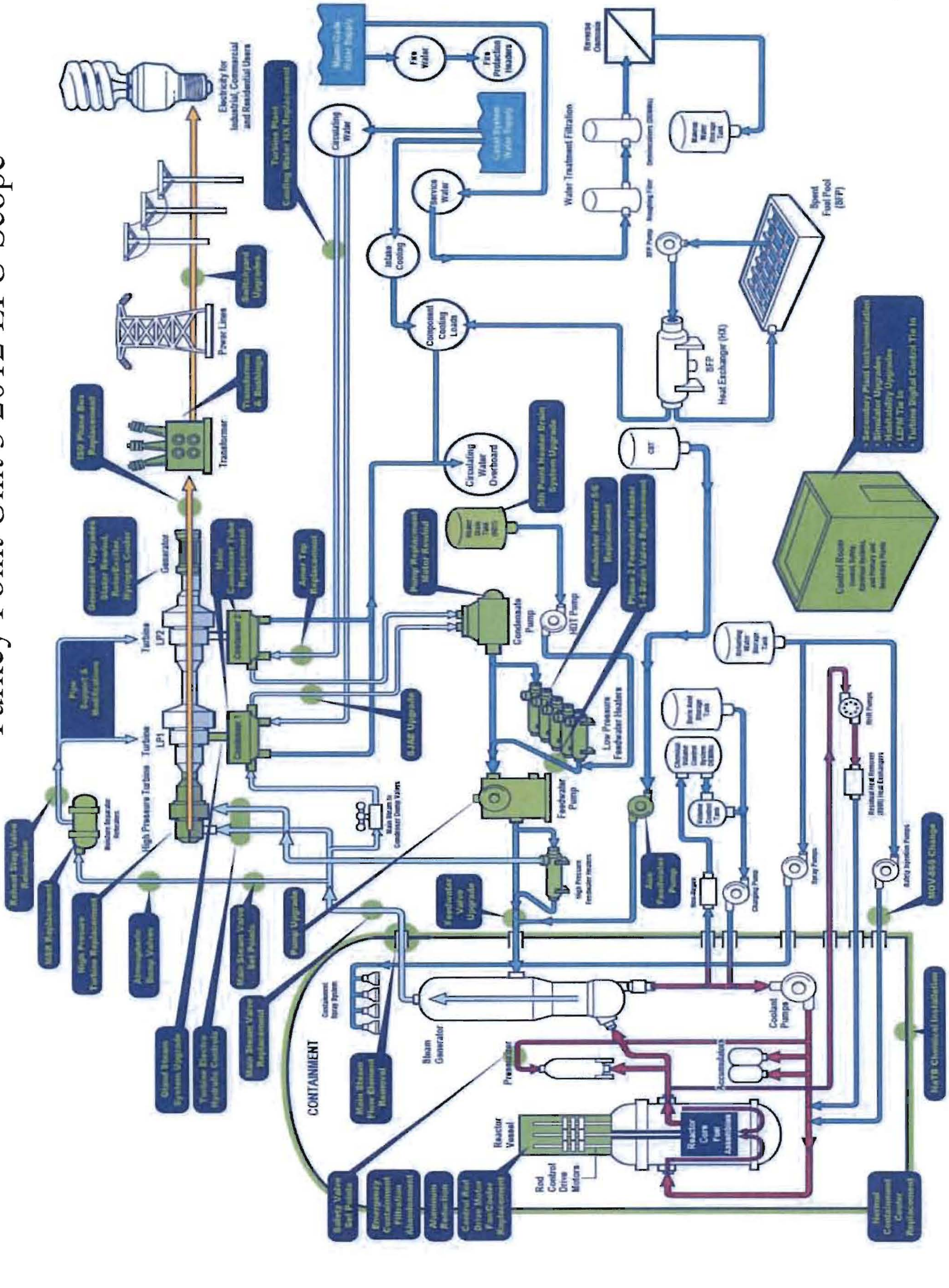
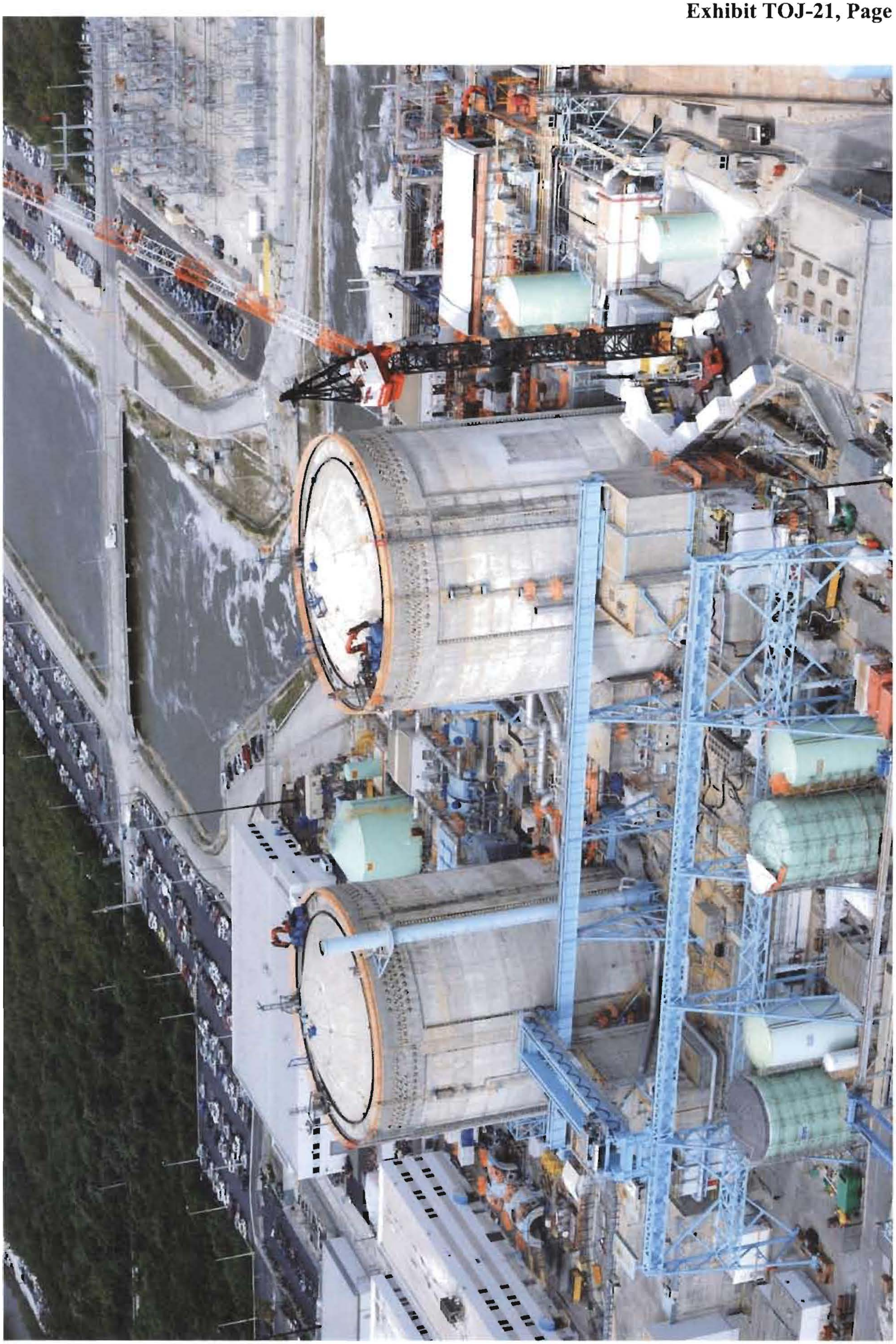
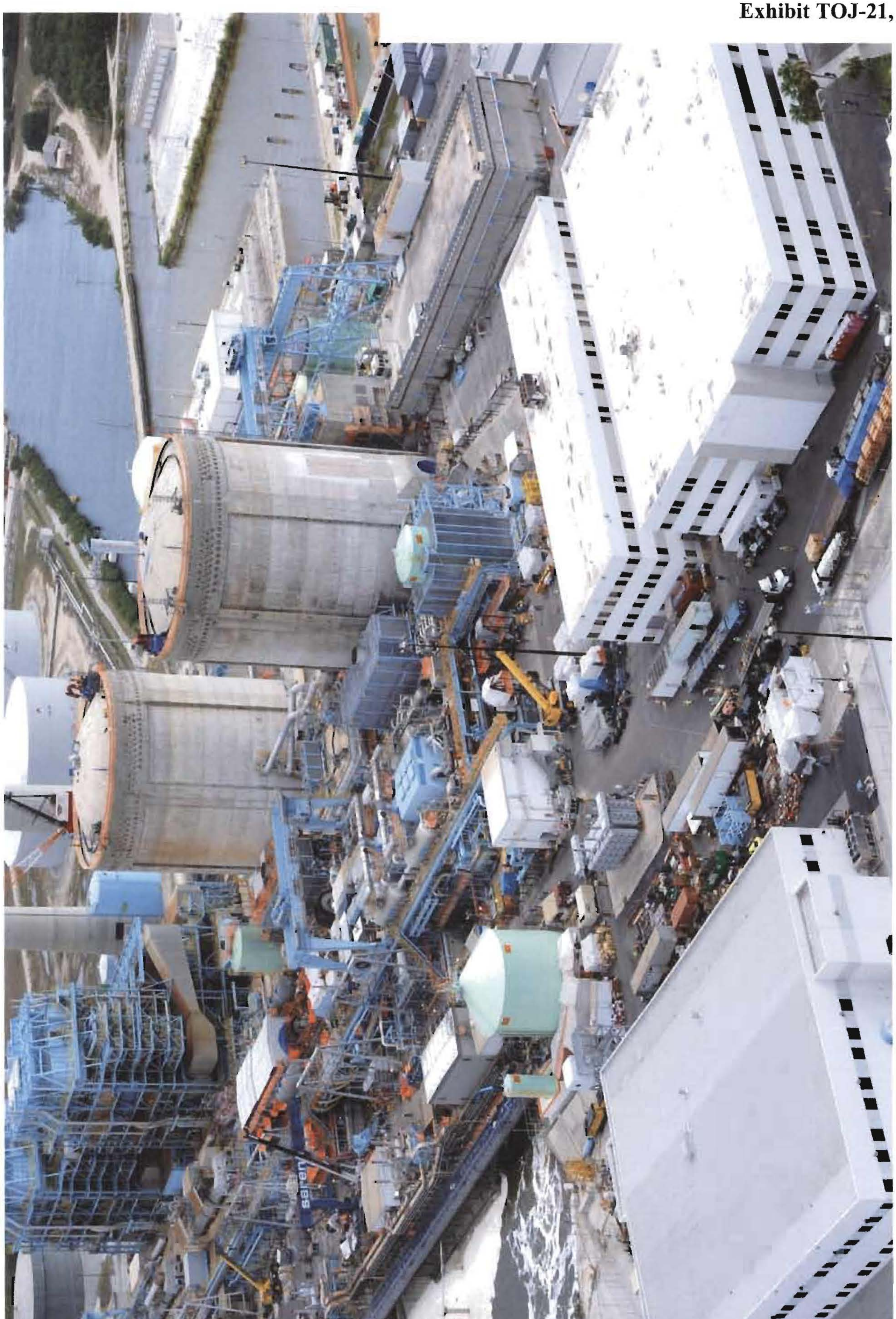
Turkey Point Unit 3 2012 EPU Scope







2011/2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 2011/2012 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

2011/2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 2011/2012 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

2011/2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 2011/2012 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
High Pressure 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

2011/2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 2011/2012 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
Low Pressure 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	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

2011/2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 2011/2012 Outage	Description	Contract	Scoping Document
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
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
Balance of Plant (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 Distributed Control system (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

2011/2012 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Unit 1 2011/2012 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

2012 Extended Power Uprate (EPU) Work Activities

St. Lucie Unit 2 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 And Air Ejector 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
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) Work Activities

St. Lucie Unit 2 2012 Outage	Description	Contract	Scoping Document
Feedwater Heaters 4A/B Replacement	Internal inspections determined needed for replacement to process the steam and feedwater flows in the uprate conditions	TEI SC2297055	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
Heater Drain and 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
Feedwater / Heater Drain/MSR Digital Controls	Instrumentation and digital controls to the feedwater heater control and dump valves, new MSRs and Drain Coolers due to EPU conditions	Feedforward SC2287468	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008
Heater Drain Pump Replacement	Larger pumps 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 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

2012 Extended Power Uprate (EPU) Work Activities

St. Lucie Unit 2 2012 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
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	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

2012 Extended Power Uprate (EPU) Work Activities

St. Lucie Unit 2 2012 Outage	Description	Contract	Scoping Document
Balance of Plant (BOP) and Nuclear Steam Supply System (NSSS) Plant Instrumentation	Set point 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, feedwater and heater drains	Bechtel PO-117820	EPU License Amendment Request (LAR) Engineering
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
Chemical Volume Control system (CVCS) Mod for Gas Collection	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
Environmental Qualification (EQ) Equipment Mods - 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

2012 Extended Power Uprate (EPU) Work Activities

St. Lucie Unit 2 2012 Outage	Description	Contract	Scoping Document
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
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
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
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

2012 Extended Power Uprate (EPU) Work Activities

St. Lucie Unit 2 2012 Outage	Description	Contract	Scoping Document
Umbrella Modification "EPU Wrap-up"	Provides the basis for plant to go to EPU conditions. Wraps up all modifications, 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
Charging Pump Safety Injection Actuation Signal (SIAS) Circuit Change	The U2 Charging Pumps, which are now credited for ECCS SBLOCA for EPU conditions, trip on SIAS.	Bechtel PO-117820	Station Engineering identified this SIAS trip must be removed for Accident conditions.
Low Pressure Turbine Torsional Tuning	During LP Turbine torsional monitoring in SL2-19 power ascension, the machine operating frequency was found to pass through the "double line" resonant frequency, making it susceptible to negative sequence induced, outer blade vibration damage. To drive this frequency outside of this range (to meet NEIL req'ts), the tuning option installs a less stiff jackshaft between the two LPs, thereby pushing the machine frequency safely below the resonant frequency.	Siemens PO-116088	OEM Recommendation

2012 Extended Power Uprate (EPU) 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
Spent Fuel Pool (SFP) Modifications	Regulatory driven modification for more highly enriched fuel required for EPU	Holtec PO-2291586	EPU LAR Engineering

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 2012 Outage	Description	Contract	Scoping Document
Sump pH Control, Install Sodium Pentaborate (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
Leading Edge Flow Meter (LEFM) Digital upgrade Phase 3 (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
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 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
Fast Acting 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 Trim Upgrade 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 (Remaining)	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 and Main Steam Control Valve Assemblies (MSIV/MSCV) Replacement	Satisfies new steam system pressure requirements at the HP turbine	Bechtel PO-117809	EPU LAR Engineering
Main Steam Safety Valve Set Point 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 Phase B	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 2012 Outage	Description	Contract	Scoping Document
High Pressure 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
Moisture Separator Reheater (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 2012 Outage	Description	Contract	Scoping Document
Normal Containment Cooling (NCC) 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 Rotating Element 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
Turbine Plant Cooling Water (TPCW) HX Replacement	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) Replacement	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 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 Snubber and Supports Installation	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
High Pressure Turbine Supply Spill Over Piping Replacement	Modifications needed for increased HP Turbine exhaust pressures and spillover	Bechtel PO-117809	EPU LAR Engineering
Secondary Instrumentation Set point and indication Changes	Changes to NSSS and BOP instrumentation are required to meet EPU conditions	Bechtel PO-117809	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
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

2012 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 3 2012 Outage	Description	Contract	Scoping Document
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
Closed Cooling Water (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	WeldTech P.O. 2304432	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
Repowering of the Alternate PTN Unit 4 Spent Fuel Cooling (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 3 2012 Outage	Description	Contract	Scoping Document
Emergency Containment Cooling (ECC) Restore Automatic Actuation of Third ECC to Reduce Containment Pressure	Auto actuation of the three Emergency Containment Cooling fans is required in the uprate conditions.	Enercon P.O. 2294494	EPU LAR Engineering
EPU Piping Vibration Modification	Piping will be monitored for increased vibrations which may require additional modifications to piping constraints in the uprate condition.	Shaw Eng PO 2296076	Operating Experience from uprates

2012 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
Environmental Qualification (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
Unit 3 Umbrella Mod – License Amendment Request (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

Table 1. Summary of 2012 Extended Power Uprate Construction Costs

Category	Detail Table No.	2012 Actual/Estimated Costs
Licensing	2	$26,071,019
Engineering & Design	3	$24,666,015
Permitting	4	$0
Project Management	5	$52,273,140
Power Block Engineering, Procurement, etc.	6	$954,929,052
Non-Power Block Engineering, Procurement, etc.	7	$1,078,425
Total EPU Construction Costs	**N/A**	**$1,059,017,651**
EPU Recoverable O&M	8	$15,283,333
Transmission Capital and Recoverable O&M	9	$27,390,139
Total Construction Costs & Transmission	**N/A**	**$1,101,691,123**

Tables include post in-service costs.

NFR Schedule AE-4, O&M and AE- 6, Construction and Transmission costs amount to $1,074,140,304, which excludes post in-service project costs.

Table 2. 2012 Licensing Costs

Category	2012 Actual/Estimated Costs
St. Lucie (PSL) License Amendment Request (LAR)	$17,087,333
Turkey Point (PTN) License Amendment Request (LAR)	$8,983,686
Total Licensing	**$26,071,019**

Table 3. 2012 Engineering and Design Costs

Category	2012 Actual/Estimated Costs
St. Lucie (PSL)	
FPL and staff augmentation engineering	$7,253,671
Turkey Point (PTN)	
FPL and staff augmentation engineering	$17,412,344
Total Engineering and Design	**$24,666,015**

Table 4. 2012 Permitting Costs

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

Table 5. 2012 Project Management Costs

Category	2012 Actual/Estimated Costs
St. Lucie (PSL)	
FPL, staff augmentation, and regulatory accounting	$19,494,825
Turkey Point (PTN)	
FPL, staff augmentation, and regulatory accounting	$32,778,315
Total Project Management	**$52,273,140**

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

Category	2012 Actual/Estimated Costs
St. Lucie (PSL)	
FPL Procured Long Lead Material	$24,148,198
Turbine Generator Equipment procured from Siemens	$37,558,738
Siemens Labor - Alliance Agreement	$48,025,173
Bechtel EPC Contract	$118,866,727
Station Indirect Outage Costs	$22,155,957
Growth in Scope - Scope & Contingency	$42,843,381
Engineering and Implementation Vendors Other than Bechtel and Siemens - (Shaw/SWEC, NRC Fees, Shaw Construction, AMES, Bartlett, Williams, Master Lee, GS4, FPL personnel in start-up testing support, employee training support, in processing personnel, QA /QC technicians, Instrumentation and Controls technicians, procedure writers, document control support and other outage support personnel, plus some materials, equipment, fuel and construction consumables)	$50,222,006
Adjustments (removal costs)	($17,098,481)
St. Lucie (PSL)	**$326,721,699**
Turkey Point (PTN)	
FPL Procured Long Lead Material	$47,827,487
Turbine Generator Equipment procured from Siemens	$29,659,103
Siemens Labor - Alliance Agreement	$70,914,024
Bechtel EPC Contract	$381,938,706
Station Indirect Outage Costs	$20,467,351
Growth in Scope - Scope & Contingency	$8,367,000
Engineering and Implementation Vendors Other than Bechtel and Siemens - (Enercon, Feedforward, Flowserve, L3 Communications Mapps, Numerical Applications, Sargent & Lundy, Structural Integrity Associates, Techcom International, Western Services Corp., and Zachry, Shaw Construction, Williams coatings, radiation protection and waste characterization, temporary facilities, temporary power, equipment rental, site security modifications, bussing and race track parking, ultrasonic testing, and micro piles)	$118,210,978
Adjustments (removal costs)	($49,177,296)
Turkey Point (PTN)	**$628,207,353**
Total Power Block Engineering, Procurement, etc.	**$954,929,052**

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

Category	2012 Actual/Estimated Costs
St. Lucie (PSL)	$111,010
Turkey Point (PTN)	$967,415
Total Non-Power Block Engineering, Procurement, etc.	**$1,078,425**

Table 8. 2012 Recoverable O&M Costs

Category	2012 Actual/Estimated Costs
St. Lucie (PSL) and Turkey Point (PTN)	
Non capitalizable Inspections & Other Minor Scopes	$9,782,951
Obsolete inventory write-off	$5,087,173
Non capitalizable computer hardware and software, office furniture and fixtures for new project-bound hires, incremental staff and augmented contract staff.	$413,209
Total Recoverable O&M	**$15,283,333**

Table 9. 2012 Transmission Costs

Category	2012 Actual/Estimated Costs
Plant Engineering	$11,132,042
Line Engineering	$30,000
Substation Engineering	$763,289
Line Construction	$210,000
Substation Construction	$15,252,202
Subtotal	**$27,387,533**
Recoverable O&M	$2,606
Total Transmission	**$27,390,139**

2013 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 2013 Outage	Description	Contract	Scoping Document
Sump pH Control, Install Sodium Pentaborate (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
Leading Edge Flow Meter (LEFM) Digital (Instrumentation) Upgrade Tie In	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
Fast Acting 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

2013 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 2013 Outage	Description	Contract	Scoping Document
Feedwater Regulating Valves Trim Upgrade 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 (Remaining)	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 and Main Steam Control Valve Assemblies (MSIV/MSCV) Replacement	Satisfies new steam system pressures requirements at the HP turbine	Bechtel PO-117809	EPU LAR Engineering
Main Steam Safety Valve Set Point 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
High Pressure 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

2013 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 2013 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
Moisture Separator Reheater (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
Normal Containment Cooling (NCC) 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

2013 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 2013 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 Rotating Element 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
Turbine Plant Cooling Water (TPCW) HX Replacement	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) Replacement	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 Snubber and Supports Installation	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

2013 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 2013 Outage	Description	Contract	Scoping Document
High Pressure 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
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
Steam Generator Blowdown Flow Instrumentation	Modifications needed to improve measurement accuracy of Steam Generator blowdown	Bechtel PO-117809	EPU LAR Engineering
Closed Cooling Water (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

2013 Extended Power Uprate (EPU) Project Work Activities

Turkey Point Unit 4 2013 Outage	Description	Contract	Scoping Document
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
Emergency Containment Coolers (ECC) Restore Automatic Actuation of Third ECC to Reduce Containment Pressure	Auto actuation of the three Emergency Containment Cooling fans is required in the uprate conditions.	Enercon P.O. 2294494	EPU LAR Engineering
EPU Piping Vibration Modification	Piping will be monitored for increased vibrations which may require additional modifications to piping constraints in the uprate condition.	Shaw Eng PO 2296076	Operating Experience from uprates
Unit 4 Turbine Building& Feedwater Platform Structure	Provide additional structural support for heavier components	Bechtel PO-117809	Engineering Evaluation

2013 Extended Power Uprate (EPU) Project Work Activities

Turkey Point 2013 On-Line Activities	Description	Contract	Scoping Document
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 Hand wheel 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
Unit 4 Umbrella Mod LAR Doc PCM # 1	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
Unit 4 Condensate Polishing	Condensate Polishing building modification to clean secondary water after major component replacements.	Shaw P.O. 2293489 Release 007	Engineering evaluation and operating experience
Site Demobilization and Site Restoration	Restoration of temporary facilities, structures, parking, construction, return office areas to pre-EPU Project conditions	Various	Engineering Modifications and FPSC Nuclear Cost recovery
Post -EPU Asset Disposal	Demolition and disposal of all construction debris, replaced vessels and components.	Various	Engineering Modifications and FPSC Nuclear Cost recovery
Post EPU Outage System Testing and Tuning	To align systems to optimal performance and re-establishes performance baselines for systems that were modified.	Various	FPL PTN Feasibility Study 2007, Turkey Point Nuclear Plant BOP EPU Scoping Study, March 2008 and Engineering Modifications

2013 Extended Power Uprate (EPU) Project Work Activities

Turkey Point 2013 On-Line Activities	Description	Contract	Scoping Document
Final Project Documentation and Close-out	Project document close-out activities which include calculation updates, Configuration Control Programs, Document Package Closeout and commercial close-out.	Various	FPL Feasibility Study 2007, Turkey Point Nuclear Plant, BOP, EPU, Scoping Study, February 2008 and Engineering modifications
Cost Recovery Close-out	Provide support and documentation for final close-out of Cost Recovery process.	Various	FPSC Nuclear Cost Recovery

2013 Extended Power Uprate (EPU) Project Work Activities

St. Lucie Plant 2013 On-Line Activities	Description	Contract	Scoping Document
Site Demobilization and Site Restoration	Restoration of temporary facilities, structures, parking, construction, return office areas to pre-EPU Project conditions	Various	Engineering Modifications and FPSC Nuclear Cost recovery
Post EPU Asset Disposal	Demolition and disposal of all construction debris, replaced vessels and components.	Various	Engineering Modifications and FPSC Nuclear Cost recovery
Post EPU Outage System Testing and Tuning	To align systems to optimal performance and re-establishes performance baselines for systems that were modified.	Various	FPL PSL Feasibility Study 2007, St. Lucie Nuclear Plant BOP EPU Scoping Study, March 2008 and Engineering Modifications
Final Project Documentation Close-out	Project document close-out activities which include calculation updates, Configuration Control Programs, Document Package Closeout and commercial close-out.	Various	FPL Feasibility Study 2007, St. Lucie Nuclear Plant, BOP, EPU, Scoping Study, February 2008 and Engineering modifications
Cost Recovery Close-out	Provide support and documentation for final close-out of Cost Recovery process.	Various	FPSC Nuclear Cost Recovery

Table 1. Summary of 2013 Extended Power Uprate Construction Costs

Category	Detail Table No.	2013 Projected Costs
Licensing	2	$0
Engineering & Design	3	$5,942,487
Permitting	4	$0
Project Management	5	$15,793,184
Power Block Engineering, Procurement, etc.	6	$174,421,527
Non-Power Block Engineering, Procurement, etc.	7	$0
Total EPU Construction Costs	**N/A**	**$196,157,198**
EPU Recoverable O&M	8	$5,167,618
Transmission Capital and Recoverable O&M	9	$250,000
Total Construction Costs & Transmission	**N/A**	**$201,574,816**

Tables include post in-service costs.

NFR Schedule P 4, O&M and P 6, Construction and Transmission costs amount to $169,163,690, which excludes post in-service project costs.

Table 2. 2013 Licensing Costs

Category	2013 Projected Costs
St. Lucie (PSL) License Amendment Request (LAR)	$0
Turkey Point (PTN) License Amendment Request (LAR)	$0
Total Licensing	**$0**

Table 3. 2013 Engineering and Design Costs

Category	2013 Projected Costs
St. Lucie (PSL)	
FPL and staff augmentation engineering	$172,800
Turkey Point (PTN)	
FPL and staff augmentation engineering	$5,769,687
Total Engineering and Design	**$5,942,487**

Table 4. 2013 Permitting Costs

Category	2013 Projected Costs
St. Lucie (PSL)	$0
Turkey Point (PTN)	$0
Total Permitting	**$0**

Table 5. 2013 Project Management Costs

Category	2013 Projected Costs
St. Lucie (PSL)	
FPL, staff augmentation, and regulatory accounting	$862,400
Turkey Point (PTN)	
FPL, staff augmentation, and regulatory accounting	$14,930,784
Total Project Management	**$15,793,184**

Table 6. 2013 Power Block Engineering, Procurement, etc. Costs

Category	2013 Projected Costs
St. Lucie (PSL)	
FPL Procured Long Lead Material	$0
Turbine Generator Equipment procured from Siemens	$0
Siemens Labor - Alliance Agreement	$0
Bechtel EPC Contract	$59,233
Station Indirect Outage Costs	$0
Growth in Scope - Scope & Contingency	$147,000
Shaw/SWEC, technicians for inspections, document control support	$203,629
Adjustments (removal costs)	$0
St. Lucie (PSL)	**$409,862**
Turkey Point (PTN)	
FPL Procured Long Lead Material	$4,526,111
Turbine Generator Equipment procured from Siemens	$10,367,646
Siemens Labor - Alliance Agreement	$30,468,986
Bechtel EPC Contract	$56,255,431
Station Indirect Outage Costs	$10,016,963
Growth in Scope - Scope & Contingency	$49,900,000
Engineering and Implementation Vendors Other than Bechtel and Siemens - (Enercon, Feedforward, Flowserve, L3 Communications Mapps, Numerical Applications, Sargent & Lundy, Structural Integrity Associates, Techcom International, Western Services Corp., and Zachry, Shaw Construction, Williams coatings, radiation protection and waste characterization, temporary facilities, temporary power, equipment rental, site security modifications, bussing and race track parking, ultrasonic testing, and micro piles)	$20,569,605
Adjustments (removal costs)	($8,093,077)
Turkey Point (PTN)	**$174,011,665**
Total Power Block Engineering, Procurement, etc.	**$174,421,527**

Table 7. 2013 Non-Power Block Engineering, Procurement, etc. Costs

Category	2013 Projected Costs
St. Lucie (PSL)	$0
Turkey Point (PTN)	$0
Total Non-Power Block Engineering, Procurement, etc.	**$0**

Table 8. 2013 Recoverable O&M Costs

Category	2013 Projected Costs
St. Lucie (PSL) and Turkey Point (PTN)	
Non capitalizable Inspections & Other Minor Scopes	$167,618
Obsolete inventory write-off	$5,000,000
Non capitalizable computer hardware and software, office furniture and fixtures for new project-bound hires, incremental staff and augmented contract staff.	$0
Total Recoverable O&M	**$5,167,618**

Table 9. 2013 Transmission Costs

Category	2013 Projected Costs
Plant Engineering	$0
Substation Engineering	$125,000
Substation Construction	$125,000
Recoverable O&M	$0
Total Transmission	**$250,000**