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**-VIA ELECTRONIC FILING-**

Ms. Carlotta Stauffer  
Commission Clerk  
The Florida Public Service Commission  
2540 Shumard Oak Blvd.  
Tallahassee, FL 32399-0850

Re: Docket No. \_\_\_\_\_  
Florida Power & Light Company's 2015 Decommissioning Study

Dear Ms. Stauffer:

In compliance with Rule 25-6.04365, F.A.C., I am enclosing for filing on behalf of Florida Power & Light Company ("FPL") the Petition of Florida Power & Light Company for Approval of its 2015 Decommissioning Study. The 2015 Nuclear Decommissioning Study, including its Executive Summary, is attached to the Petition. The study results are based on estimates and assumptions that follow Nuclear Regulatory Commission ("NRC") requirements and industry guidelines for the development of the costs to remove and dismantle nuclear power plants decades into the future. Funds are maintained and interest reinvested in the decommissioning trusts as required by the NRC, Internal Revenue Service, Federal Energy Regulatory Commission and this Commission. Under federal law, these funds may only be used for nuclear decommissioning, are not available for any other use, and do not earn a return or profit for FPL. Key findings:

- (1) The trusts remain adequately funded so that FPL customers are not required to bear undue risk of incurring additional costs when the time comes to decommission FPL's nuclear power plants.
- (2) FPL customers have not contributed to the decommissioning trusts since 2005, and the study confirms that, as of Dec. 31, 2015, the trusts continue to be adequately funded without FPL customer contributions.

Please feel free to contact me at 561-304-5639 if you have any questions about this transmittal.

Respectfully submitted,

*/s/ John T. Butler*

John T. Butler  
Enclosure

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

In re: Petition of Florida Power & Light ) Docket No. \_\_\_\_\_  
Company for Approval of its 2015 Nuclear )  
Decommissioning Study ) Filed: December 14, 2015  
\_\_\_\_\_ )

**PETITION OF FLORIDA POWER & LIGHT COMPANY FOR APPROVAL  
OF ITS 2015 NUCLEAR DECOMMISSIONING STUDY**

Florida Power & Light Company (“FPL”), pursuant to Rule 25-6.04365, Florida Administrative Code (“F.A.C.”), petitions the Commission to approve FPL’s updated study concerning the decommissioning of its nuclear generation units (the “2015 Decommissioning Study”). The 2015 Decommissioning Study is comprised of two separate volumes, for the St. Lucie and Turkey Point plant sites, which are attached hereto and incorporated herein by reference.

1. Pursuant to Rule 25-6.0435, F.A.C., each utility that owns a nuclear generating plant is required to file a Nuclear Decommissioning Study on a regular basis to ensure that there are sufficient funds on hand at the time of decommissioning to meet all required expenses. As shown in the 2015 Decommissioning Study, based on FPL’s assumptions such as the rate of burial cost escalation and fund earnings assumptions, maintaining the current annual accrual of \$0 will satisfy FPL’s retail share of the future cost of total nuclear decommissioning costs. Therefore, FPL requests no change to the accrual for nuclear decommissioning.

2. In addition, as required by the Commission in Order No. PSC-11-0381-PAA-EI , FPL has updated its estimates for the last core of nuclear fuel (“Last Core”) and end of life materials and supplies (“EOL M&S”) inventories as part of the 2015 Decommissioning Study. FPL requests no change in the accruals for Last Core and EOL M&S at this time. FPL will

address the updated estimates for Last Core and EOL M&S in its accruals as part of FPL's next general base rate proceeding.

WHEREFORE, FPL respectfully requests that the Commission approve its 2015 Decommissioning Study.

Respectfully submitted,

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Vice President and General Counsel  
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By: /s/ John T. Butler  
John T. Butler  
Fla. Bar No. 283479

**CERTIFICATE OF SERVICE**

**Docket No.** \_\_\_\_\_

**I HEREBY CERTIFY** that a true and correct copy of Florida Power & Light Company's Petition for Approval of its 2015 Nuclear Decommissioning Study has been furnished by electronic service on December 14, 2015 to the following:

<p>Mary Anne Helton, Esq. Deputy General Counsel Division of Legal Services Florida Public Service Commission 2540 Shumard Oak Blvd Tallahassee, Florida 32399-0850 <a href="mailto:mhelton@psc.state.fl.us">mhelton@psc.state.fl.us</a></p>	<p>J. R. Kelly, Esq. Office of Public Counsel c/o The Florida Legislature 111 West Madison Street, Room 812 Tallahassee, Florida 32399 <a href="mailto:Kelly.jr@leg.state.fl.us">Kelly.jr@leg.state.fl.us</a></p>
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By: /s/ John T. Butler

John T. Butler

Fla. Bar No. 283479

FLORIDA POWER & LIGHT COMPANY

2015 DECOMMISSIONING STUDY

ST. LUCIE NUCLEAR UNIT

NOS. 1 & 2

**December 2015**

**Florida Power & Light Company  
2015 Decommissioning Study  
St. Lucie Nuclear Units**

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SECTION 1

EXECUTIVE SUMMARY

## Overview

FPL's 2015 Nuclear Decommissioning Study results are based on estimates and assumptions that follow Nuclear Regulatory Commission ("NRC") requirements and industry guidelines for the development of the costs to remove and dismantle nuclear power plants years into the future. Funds are maintained and interest is reinvested in the decommissioning trusts as required by the NRC, Internal Revenue Service, Federal Energy Regulatory Commission ("FERC") and Florida Public Service Commission ("FPSC" or the "Commission"). Under federal law, these funds may only be used for nuclear decommissioning, are not available for any other use and do not earn a return or profit for FPL. The study is essentially a snapshot, which shows that based on current assumptions FPL's nuclear decommissioning trust funds are appropriately funded, i.e., the current fund balances exceed the expected costs of decommissioning on a present value basis. Compared to 2010, the currently calculated funding position has narrowed primarily because the increase in decommissioning costs outpaced the realized earnings from the trust fund investments over the last five years. The 2015 study and the 2010 study have been prepared excluding unrealized gains and losses. If one includes these unrealized gains, the funding position actually increased modestly between 2010 and 2015, reflecting an average annual earnings rate for the trust funds of about 5.1 percent over the five year period. FPL customers have not contributed to the decommissioning trusts since 2005, and the study confirms that, as of December 31, 2015, the trusts continue to be adequately funded without FPL customer contributions.

Decommissioning studies represent the aggregation of numerous estimates for activities and costs that will not be incurred for at least 17 years. As such, they are highly dependent upon input assumptions that can and will change over time, such that future funding positions could differ from today's position. Since the 2010 study, estimated decommissioning costs have increased more than the rate of inflation, primarily driven by actual data ascertained from recent, ongoing decommissioning experience in the industry. The largest increases of costs were in security, program management and spent fuel management. FPL has no evidence to suggest that the rate of increase experienced over these last five years would continue prospectively, but instead believes that these increases are due to the heightened level of current decommissioning activity which has significantly expanded our knowledge base regarding actual costs for certain specific activities compared to what was known in 2010. The current assumed long-term fund earnings rate of 3.7 percent is 0.2 percent lower than the assumption utilized in the 2010 study due to softened post-recession long-term return expectations in light of uncertainty in the sustainability of long-term global economic growth and lower base of interest rates. The increase in projected decommissioning costs and the decrease in the long-term fund earnings rate reaffirm the importance of maintaining adequate funding and the value of the periodic review of these studies as required by FPSC rule.

## 2015 Study Approach

The information contained in this 2015 Decommissioning Study is presented in compliance with Rule 25-6.04365, Florida Administrative Code, and prior Commission Orders. FPL contracted TLG Services, Inc. ("TLG"), the leading provider of these services to the U.S. nuclear industry, to prepare its 2015 site-specific nuclear decommissioning cost analysis and comparison reports, which are estimated based on NRC requirements, industry guidelines, and prior experience. TLG includes the most up-

to-date actual decommissioning information available to ensure the methodology used to prepare the cost analysis is reasonable.

FPL selected the DECON (immediate dismantlement) decommissioning option for its units. The DECON method provides not only a lower cost, but also enables a coordinated sequence of decommissioning events, which allows for a one-time mobilization of contractor personnel and equipment. FPL's choice of the DECON method is consistent with the method in prior studies approved by the Commission for purposes of determining FPL's appropriate accrual and funding requirements.

### Escalation Rate

The 2015 Decommissioning Study assumes that future decommissioning costs grow at an average rate of approximately 3.2 percent per year. This is only a small increase over the average escalation rate of 3.0 percent assumed in the 2010 study. FPL notes that the current escalation rates are within the typical post-recession range given that the current macro-economic market has improved since the last study.

### Spent Fuel Management

Consistent with prior studies and assumptions approved by the Commission, the decommissioning cost estimates include the cost associated with interim storage of spent nuclear fuel ("SNF") on site until such time the Department of Energy ("DOE") is able to remove SNF from the site. Consistent with the 2010 study, FPL reflects the reimbursements from the U.S. Government to cover the cost incurred for managing and storing SNF that would not have been incurred but for DOE's delay in SNF disposal. As such and for purposes of this study, the DOE is expected to make payments to FPL to cover spent fuel management costs incurred by FPL prior to 2063 for St. Lucie and 2059 for Turkey Point. The ultimate timing and amount of reimbursements will depend on many factors, including but not limited to, the DOE's ability to receive SNF and the Government's compliance with the terms of the Settlement Agreement.

### Conclusion

The 2015 Decommissioning Study indicates that the trusts are at an adequate funding level given current assumptions and projections. FPL has earned its customers' trust by using careful, prudent investment strategies in all facets of its business including the management of its nuclear decommissioning trusts. Despite market volatility, the funds remain secure. As a result, FPL's current annual expense accrual requirements for decommissioning costs presented in this study support a zero accrual and funding requirement as of December 31, 2015.

In addition, as required by the Commission in Order Nos. FPSC-02-0055-PAA-EI and FPSC-10-0153-FOF-EI, FPL has updated its estimates for End-of-Life Nuclear Fuel Last Core and End-of-Life Materials and Supplies Inventory balances for each of its nuclear sites. This information is provided for informational purposes with this study. FPL is not requesting a change in accruals at this time. Rather, FPL believes that the results of these updated values for should be addressed in FPL's next base rate proceeding and that the appropriate changes in accruals, if any, should be made at that time.

SECTION 2

ASSUMPTIONS

**Florida Power & Light Company  
2015 Decommissioning Study  
St. Lucie Nuclear Units  
Assumptions**

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Assumptions Summary

Following is a summary of the assumptions used to derive the annual accrual, and funding and revenue requirements. These assumptions are more fully developed on the following pages.

	<u>Unit No. 1</u>	<u>Unit No. 2</u>
Decommissioning Method	SAFSTOR/ Integrated DECON (Prompt Removal/ Dismantling	DECON (Prompt Removal/ Dismantling)
Total Decommissioning Cost Per TLG Services, Inc. (current cost estimate in 2015 \$)	\$934,649,000	\$871,831,000
FPL's Cost of Decommissioning (Jurisdictional and net of Unit No. 2 Participants' obligation) In 2015 \$	\$884,468,000	\$702,501,000
Method of Funding (2015 – End)	Qualified/ Nonqualified	Qualified/ Nonqualified
Funding Periods (Years to License Expiration)	20.21	27.29
Assumed Fund Earnings rate	3.7%	3.7%
Average Escalation Rate for Decommissioning Costs (2015 – End)	3.11%	3.21%
FPL Ownership Allocation (%)	100%	85.14933%
FPSC Jurisdictional Separation Factor (%)	94.6310%	94.6310%
Estimated Fund Balance - Qualified (12/31/15)	\$557,949,000	\$510,251,000

**Florida Power & Light Company  
2015 Decommissioning Study  
St. Lucie Nuclear Units  
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	<u>Unit No. 1</u>	<u>Unit No. 2</u>
Estimated fund Balance - Nonqualified (12/31/15)	\$162,682,000	\$79,205,000
End of Life M & S Inventory Value - Net Of Participants' obligation (12/31/15)	N/A	\$24,891,575
End of Life Nuclear Fuel Last Core Values - Net of Participants' obligation (12/31/15)	\$89,300,000	\$98,700,000
Year of Last Pick Up of Spent Fuel	2073	2073
Expected DOE Reimbursement (Current cost estimate in 2015 \$)	\$162,675,000	\$126,353,000

Decommissioning Methods

For purposes of this analysis, decommissioning is defined as the activity whereby nuclear facilities are removed safely from service and residual radioactivity is reduced to a level that permits release of the property for unrestricted use and termination of the operating license granted under Title 10 CFR Part 50. Decommissioning also includes the dismantlement, disposal and site restoration activities associated with the non-contaminated portion of the facilities. These activities are not required for termination of the operating license, but are required to address other non-radiological requirements associated with the release of the site.

The Nuclear Regulatory Commission (NRC) has defined three acceptable decommissioning methods: Prompt Removal/Dismantling (DECON); Safe Storage/Deferred Decontamination (SAFSTOR); and Entombment (ENTOMB). The study utilizes the NRC terminology, but also includes the additional activities required to accommodate the non-contaminated portion of the facilities.

The DECON and SAFSTOR alternatives were both examined and are presented in the (TLG) Decommissioning Cost Analysis (Section 11) of this filing. The ENTOMB alternative was not considered, because it is considered impractical for a facility which generates significant amounts of long-lived radioactive material due to neutron activation. FPL selected an integrated DECON decommissioning option for St. Lucie Units 1 and 2. Due to the difference in the operating license period of Units 1 and 2, this option entails approximately 7 years of dormancy (SAFSTOR) for Unit 1 followed by prompt

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dismantlement (DECON) of both Units 1 and 2. The integrated DECON method provides not only a lower cost, but also enables a sequence of events, which allows for a one-time mobilization of contractor personnel and equipment. This method is consistent with the method in prior studies approved by the Commission for purposes of determining the appropriate accrual and funding requirements.

Total Decommissioning Costs

Below are the total estimated costs of decommissioning the St. Lucie facility as provided by FPL's consultant, TLG Services, Inc. in 2015 dollars.

St. Lucie Unit No. 1	
Labor	\$ 489,473,000
Equip & Materials	183,090,000
Transportation	25,948,000
Burial	86,951,000
Other	<u>149,186,000</u>
Total	934,649,000

St. Lucie Unit No. 2	
Labor	\$ 472,699,000
Equip & Materials	163,089,000
Transportation	20,880,000
Burial	94,885,000
Other	<u>120,279,000</u>
Total	871,831,000

Funding Method

In Docket No. 810100-EU, Order No. 10987 issued July 13, 1982, the FPSC ordered FPL to establish a funded reserve. Beginning in 1983 FPL began making contributions, on a net of tax basis, to an externally funded reserve. In 1986, the Treasury Department issued temporary regulations under Internal Revenue Code Section 468A relating to the deductibility of contributions made to a qualified decommissioning fund. These regulations, which were finalized in March of 1988, provide for an annual election by the taxpayer to make tax-deductible contributions to a qualified nuclear decommissioning fund. Qualified nuclear decommissioning funds have been established by FPL for each of the four nuclear units. FPL elected to make contributions to the qualified funds, to the maximum allowed, for the years 1984 through 1987, 1992 through 2004 and for the year

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to date period ended August 31, 2005. Per the Stipulation and Settlement Agreement approved by the Commission in FPSC Order No. FPSC-05-0902-S-EI, FPL suspended accruals effective September 1, 2005, and as such, no additional contributions to the funds have been made subsequent to that date.

The funding analysis presented in Section G of this study indicates that no additional contributions to the qualified and nonqualified funds are projected to be required through the remainder of the funding period that ends with the expiration of the unit's operating license. Only the after-tax earnings of the trust fund investments are assumed to continue to be reinvested and accumulated in the respective funds. Future decommissioning expenditures are assumed to be distributed from the qualified and nonqualified funds in proportion to the balance accumulated at the time of expenditure.

#### Funding Period

The funding period, to the extent funding is required, is that period over which revenues are collected from ratepayers for purposes of decommissioning the St. Lucie Units. Funding periods for both units end on the last day of the month preceding the month in which the operating license for the unit is due to expire. The operating license expiration dates for the St. Lucie units are as follows.

- St. Lucie Unit No. 1 - March 1, 2036
- St. Lucie Unit No. 2 - April 6, 2043

Based on the results of the funding analysis presented in Support Schedule G, no additional funding is required at this time.

#### Fund Earnings Rate

For purposes of this 2015 study update and funding analysis, the projected annual funds earnings rate, net of taxes and all other administrative costs charged to the trust funds, for Units 1 and 2 qualified and nonqualified fund investments, is assumed to be 3.7%. This assumption is based on a projected real long-term, after tax and net of fees, earnings rate of 1.3% plus an estimated long term average inflation rate of 2.4%. The long-term, after tax and net of fees earnings rate reflects the projection of continued adequacy of the funds and assumes a conservative investment strategy where the funds are moved to 100% fixed income prior to the first year of decommissioning and a more conservative all bonds & cash asset mix in the final years of decommissioning. FPL recognizes that over

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the long-term period there will likely be periods when the earned return may be greater or less than the assumed 3.7%. Consistent with prior Commission practice and Rule 25-6.04365 (FAC) the assumptions presented in this 2015 study will be reviewed and updated as appropriate “at least once every five years”.

The annual rates of change in CPI were taken from “The U. S. Economy, The 30 – Year Outlook, August 2015”, published by Global Insight.

Escalation Rate

The annual escalation rates used to estimate total future dismantlement costs from 2015 through the final year of decommissioning are as follows:

	<u>Average Annual Escalation Rate</u>
St. Lucie Unit No. 1	3.11%
St. Lucie Unit No. 2	3.21%

The above rates were derived by applying separate inflation indices to each of the major cost components of Labor, Materials and Equipment, Transportation, Burial, and Other.

<u>Cost Component</u>	<u>Inflation Index</u>
Labor	Compensation per Hour
Materials and Equip.	PPI - Intermediate Materials, Supplies, and Components
Transportation	GDP Deflator-Transportation
Burial	FPL Analysis & CPI
Other	GDP (Implicit)

For purposes of this 2015 study update, the inflation indices were obtained from The U.S. Economy, The 30 – Year Outlook, August 2015”, published by Global Insight except for the burial index.

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The burial cost estimates are assumed to escalate at an average annual rate of 3.2%. This is an increase of 0.2% from the rate assumed in the 2010 study. FPL has an agreement with Energy Solutions which provides for the long-term disposal of Class A waste generated during decommissioning. As such, burial costs for disposal of Class A waste is estimated based on the Energy Solutions agreement. Escalation of pricing under this agreement is tied to changes in the Consumer Price Index (CPI). In addition, the cost estimates for processed/conditioned (at off-site recycling center) disposal of Class A waste is assumed to be at a competitive rate comparable to the Energy Solutions pricing. Burial cost rates for Class B and Class C waste, not covered by the Energy Solutions Agreement, are less certain and based on rates equivalent to Barnwell published rates. The escalation rate applicable to Class B and C waste is assumed to be 6.3% which approximates the historical rate of change of the most recently published Barnwell rates. The resulting annual escalation rate of 3.2% is a weighted average rate for both St. Lucie and Turkey Point. The St. Lucie component is a weighted rate based on Class A waste (approx. 86% of total burial costs) at the estimated long-term CPI rate of 2.4% and Class B and C waste (approx. 14% of total burial costs) estimated at 6.3%.

For a more detail calculation of the overall weighted average escalation rate and annual rate of change for each component please refer to Support Schedule G ("Inflation and Funding Analysis").

FPL/Participant Ownership Share of Nuclear Units

The participants and their ownership interests in the St. Lucie facility are as follows:

	<u>St. Lucie Unit No. 1</u>	<u>St. Lucie Unit No. 2</u>
Florida Power & Light Company	100.0%	85.10449%
Orlando Utilities Commission	0.0	6.08951%
Florida Municipal Power Agency	<u>0.0</u>	<u>8.80600%</u>
Total	<u>100.0%</u>	<u>100.00000%</u>

For purposes of allocating decommissioning costs between FPL and Participants in the St. Lucie Unit No. 2, an adjustment was made to the ownership percentages to reflect the appropriate Common Facility cost obligation of participants.

This adjustment was necessary because the decommissioning cost study attributes common facility costs to St. Lucie No. 2. Because the Participants contractual obligation

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currently provides that they pay for only their ownership share times one-half of the common facility costs, to apply their ownership share to the total cost of decommissioning Unit No. 2 would overstate the participants' cost obligation. This adjustment to the ownership percentage is reflected in what is termed a "Cost Allocation Factor" and represents the cost obligation of FPL and participants as a percentage of the total costs of decommissioning. The "Cost Allocation Factor" calculation is given in Support Schedule H "Cost Allocation Analysis".

The Cost Allocation Factors for St. Lucie Unit No. 2 are:

	<u>St. Lucie No. 2</u>
Florida Power & Light Company	85.14933%
Participants	<u>14.85067%</u>
Total	<u>100.00000%</u>

**St. Lucie Unit No. 2  
Participant Owners Funding Status**

<u>Participant</u>	<u>Allocated Share</u>	<u>\$ thousands</u>		
		<u>Allocated Costs 2015\$'s</u>	<u>Required at 12/31/2015 <sup>(a)</sup></u>	<u>Amount Funded at 11/30/2015 <sup>(b)</sup></u>
Orlando Utilities Commission (OUC)	6.07118%	\$52,930	\$28,053	\$35,670
Florida Municipal Power Agency (FMPA)	<u>8.77949%</u>	<u>76,542</u>	<u>40,567</u>	<u>51,582</u>
Participant's Total	14.85067%	\$129,473	<u>\$68,621</u>	<u>\$87,251</u>
Florida Power and Light	<u>85.14933%</u>	<u>742,358</u>		
Total	<u>100.00000%</u>	<u>\$871,831</u>		

**Notes:**

- (a) - At December 31, 2015, the funded balance should approximate 53% (32 yrs. / 60 yrs.) of decommissioning costs.
- (b) - Excluding unrealized market gains/losses

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FPSC Jurisdictional Factor

The factor applicable to both units is 94.6310%.

Fund Balances

Estimated/actual fund balances (qualified and nonqualified) at December 31, 2015<sup>(a)</sup> for each of the two St. Lucie Units are as Follows:

	<u>Qualified</u>	<u>Nonqualified</u>
Unit No. 1	\$557,949,000	\$162,682,000
Unit No. 2	\$510,251,000	\$79,205,000

(a) Excluding unrealized market gains/losses.

See support Schedule C ("Projected Fund and Reserve Balances") for detail composition and adjustments to the qualified and nonqualified fund balances.

End of Life Materials and Supplies Inventory Values

The decommissioning cost estimates contained in the TLG Decommissioning Cost Analysis section of this study and in the funding analysis contained in Support Schedule G of this filing do not take into consideration the unrecovered value of any Materials and Supplies Inventories that will ultimately exist at the site following shut down of both units. Both FPL and this Commission have previously recognized that there will be a level of inventories that will remain at the end of life of Unit No. 2, the last unit to reach end of license, which must be recovered prior to the end of site operations. These inventories are unique and will have little value other than scrap value when the units are decommissioned. In Order No. FPSC-02-0055-PAA-EI, the Commission authorized FPL to begin recording the amortization of estimated end of life materials and supplies costs as a base rate fuel expense with a credit to a separate (unfunded) sub-account of Reserve Account 228. Additionally, the Commission directed the Company to address the costs associated with the materials and supplies in subsequent decommissioning studies





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(spent fuel settlement agreement) with the U.S. Government in 2009 agreeing to dismiss with prejudice lawsuits filed against the U.S. Government seeking damages caused by the DOE's failure to dispose of spent nuclear fuel from FPL's nuclear plants. As such, the DOE is expected to continue to make payments to FPL to cover the costs incurred for managing and storing the spent fuel that it would not have incurred but for DOE's delay in performance.

Below are the St. Lucie estimated costs of Decommissioning expected to be recovered from the DOE as provided by FPL's consultant, TLG Services, Inc. in 2015 dollars.

St. Lucie Unit No. 1			
Labor	\$		55,499,000
Equip & Materials			86,591,000
Other			<u>20,585,000</u>
Total			162,675,000

St. Lucie Unit No. 2			
Labor	\$		47,382,000
Equip & Materials			62,074,000
Other			<u>16,898,000</u>
Total			126,353,000

Further discussion of the costs and assumptions regarding DOE reimbursement is contained in Section 3.8 of the Decommissioning Cost Analysis for the St. Lucie Plant, Units 1 and 2 dated November, 2015.

Annual Decommissioning Accrual Requirements

FPL's current annual expense accrual requirements for St Lucie Nuclear Plant Decommissioning costs presented in this study support a zero accrual and funding requirement as of December 31, 2015. The decommissioning costs estimates, funding analysis, and supporting assumptions presented in this study were prepared in a manner consistent with prior Commission approved studies, methodologies and practices.

SECTION 3

SUPPORT SCHEDULE A  
Nuclear Decommissioning Reserve Balance  
December 31, 2010 through November 30, 2015

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Reserve Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

<u>December 31, 2010</u>	<u>Beginning Balance</u>	<u>Revenues Collected</u>	<u>Earnings to Reserve</u>	<u>Ending Balance</u>
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$237,838	\$0	\$7,993	\$245,831
Turkey Point Unit No. 4	254,811	0	8,566	263,377
St. Lucie Unit No. 1	214,314	0	7,202	221,516
St. Lucie Unit No. 2	104,253	0	3,519	107,772
TOTAL	<u>\$811,216</u>	<u>\$0</u>	<u>\$27,280</u>	<u>\$838,496</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$326,529	\$0	\$12,830	\$339,359
Turkey Point Unit No. 4	374,182	0	14,695	388,877
St. Lucie Unit No. 1	423,056	0	16,614	439,670
St. Lucie Unit No. 2	387,013	0	15,179	402,192
TOTAL	<u>\$1,510,781</u>	<u>\$0</u>	<u>\$59,317</u>	<u>\$1,570,097</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$564,367	\$0	\$20,823	\$585,191
Turkey Point Unit No. 4	628,993	0	23,261	652,254
St. Lucie Unit No. 1	637,370	0	23,816	661,186
St. Lucie Unit No. 2	491,266	0	18,698	509,963
TOTAL	<u>\$2,321,996</u>	<u>\$0</u>	<u>\$86,597</u>	<u>\$2,408,593</u>
 <u>December 30, 2011</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$245,831	\$0	\$9,497	\$255,329
Turkey Point Unit No. 4	263,377	0	10,178	273,555
St. Lucie Unit No. 1	221,516	0	8,557	230,073
St. Lucie Unit No. 2	107,772	0	4,181	111,953
TOTAL	<u>\$838,496</u>	<u>\$0</u>	<u>\$32,414</u>	<u>\$870,910</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$339,359	\$0	\$9,987	\$349,346
Turkey Point Unit No. 4	388,877	0	11,437	400,314
St. Lucie Unit No. 1	439,670	0	12,928	452,598
St. Lucie Unit No. 2	402,192	0	11,813	414,005
TOTAL	<u>\$1,570,097</u>	<u>\$0</u>	<u>\$46,165</u>	<u>\$1,616,262</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$585,191	\$0	\$19,484	\$604,675
Turkey Point Unit No. 4	652,254	0	21,615	673,869
St. Lucie Unit No. 1	661,186	0	21,485	682,671
St. Lucie Unit No. 2	509,963	0	15,995	525,958
TOTAL	<u>\$2,408,593</u>	<u>\$0</u>	<u>\$78,579</u>	<u>\$2,487,173</u>

(1) Balances exclude unrealized market gains/losses.

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Reserve Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

<u>December 31, 2012</u>	<u>Beginning Balance</u>	<u>Revenues Collected</u>	<u>Earnings to Reserve</u>	<u>Ending Balance</u>
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$255,329	\$0	\$9,424	\$264,753
Turkey Point Unit No. 4	273,555	0	10,100	283,654
St. Lucie Unit No. 1	230,073	0	8,491	238,565
St. Lucie Unit No. 2	111,953	0	4,149	116,102
TOTAL	<u>\$870,910</u>	<u>\$0</u>	<u>\$32,164</u>	<u>\$903,075</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$349,346	\$0	\$17,029	\$366,375
Turkey Point Unit No. 4	400,314	0	19,503	419,817
St. Lucie Unit No. 1	452,598	0	22,050	474,648
St. Lucie Unit No. 2	414,005	0	20,147	434,152
TOTAL	<u>\$1,616,262</u>	<u>\$0</u>	<u>\$78,729</u>	<u>\$1,694,991</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$604,675	\$0	\$26,453	\$631,128
Turkey Point Unit No. 4	673,869	0	29,602	703,471
St. Lucie Unit No. 1	682,671	0	30,542	713,213
St. Lucie Unit No. 2	525,958	0	24,296	550,254
TOTAL	<u>\$2,487,173</u>	<u>\$0</u>	<u>\$110,893</u>	<u>\$2,598,066</u>
 <u>December 31, 2013</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$264,753	\$0	\$9,315	\$274,067
Turkey Point Unit No. 4	283,654	0	9,982	293,637
St. Lucie Unit No. 1	238,565	0	8,393	246,958
St. Lucie Unit No. 2	116,102	0	4,101	120,203
TOTAL	<u>\$903,075</u>	<u>\$0</u>	<u>\$31,791</u>	<u>\$934,865</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$366,375	\$0	\$31,896	\$398,271
Turkey Point Unit No. 4	419,817	0	36,516	456,333
St. Lucie Unit No. 1	474,648	0	41,270	515,918
St. Lucie Unit No. 2	434,152	0	37,728	471,880
TOTAL	<u>\$1,694,991</u>	<u>\$0</u>	<u>\$147,410</u>	<u>\$1,842,401</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$631,128	\$0	\$41,210	\$672,338
Turkey Point Unit No. 4	703,471	0	46,498	749,969
St. Lucie Unit No. 1	713,213	0	49,663	762,876
St. Lucie Unit No. 2	550,254	0	41,829	592,083
TOTAL	<u>\$2,598,066</u>	<u>\$0</u>	<u>\$179,200</u>	<u>\$2,777,266</u>

(1) Balances exclude unrealized market gains/losses.

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Reserve Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

<u>December 31, 2014</u>	<u>Beginning Balance</u>	<u>Revenues Collected</u>	<u>Earnings to Reserve</u>	<u>Ending Balance</u>
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$274,067	\$0	\$9,941	\$284,009
Turkey Point Unit No. 4	293,637	0	10,654	304,290
St. Lucie Unit No. 1	246,958	0	8,957	255,915
St. Lucie Unit No. 2	120,203	0	4,377	124,580
TOTAL	<u>\$934,865</u>	<u>\$0</u>	<u>\$33,929</u>	<u>\$968,795</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$398,271	\$0	\$15,096	\$413,367
Turkey Point Unit No. 4	456,333	0	17,302	473,635
St. Lucie Unit No. 1	515,918	0	19,575	535,493
St. Lucie Unit No. 2	471,880	0	17,857	489,737
TOTAL	<u>\$1,842,401</u>	<u>\$0</u>	<u>\$69,830</u>	<u>\$1,912,231</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$672,338	\$0	\$25,037	\$697,375
Turkey Point Unit No. 4	749,969	0	27,956	777,925
St. Lucie Unit No. 1	762,876	0	28,532	791,408
St. Lucie Unit No. 2	592,083	0	22,234	614,317
TOTAL	<u>\$2,777,266</u>	<u>\$0</u>	<u>\$103,760</u>	<u>\$2,881,026</u>
 <u>November 30, 2015</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$284,009	\$0	\$9,088	\$293,096
Turkey Point Unit No. 4	304,290	0	9,739	314,029
St. Lucie Unit No. 1	255,915	0	8,188	264,103
St. Lucie Unit No. 2	124,580	0	4,001	128,581
TOTAL	<u>\$968,795</u>	<u>\$0</u>	<u>\$31,016</u>	<u>\$999,810</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$413,367	\$0	\$15,892	\$429,259
Turkey Point Unit No. 4	473,635	0	18,207	491,842
St. Lucie Unit No. 1	535,493	0	20,585	556,078
St. Lucie Unit No. 2	489,737	0	18,805	508,542
TOTAL	<u>\$1,912,231</u>	<u>\$0</u>	<u>\$73,489</u>	<u>\$1,985,720</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$697,375	\$0	\$24,980	\$722,355
Turkey Point Unit No. 4	777,925	0	27,946	805,871
St. Lucie Unit No. 1	791,408	0	28,773	820,181
St. Lucie Unit No. 2	614,317	0	22,806	637,123
TOTAL	<u>\$2,881,026</u>	<u>\$0</u>	<u>\$104,504</u>	<u>\$2,985,530</u>

(1) Balances exclude unrealized market gains/losses.

SECTION 4

SUPPORT SCHEDULE B  
Nuclear Decommissioning Fund Balance  
December 31, 2010 through November 30, 2015

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Fund Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

	<u>Beginning Balance</u>	<u>Contribution</u>	<u>Fund Earnings</u>	<u>Ending Balance</u>
<u>December 31, 2010</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$146,092	\$0	\$4,910	\$151,002
Turkey Point Unit No. 4	156,517	0	5,262	161,779
St Lucie Unit No. 1	131,642	0	4,424	136,066
St Lucie Unit No. 2	64,037	0	2,162	66,199
Total	<u>\$498,289</u>	<u>\$0</u>	<u>\$16,757</u>	<u>\$515,046</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$326,529	\$0	\$12,830	\$339,359
Turkey Point Unit No. 4	374,182	0	14,695	388,877
St Lucie Unit No. 1	423,056	0	16,614	439,670
St Lucie Unit No. 2	387,013	0	15,179	402,191
Total	<u>\$1,510,781</u>	<u>\$0</u>	<u>\$59,317</u>	<u>\$1,570,097</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$472,621	\$0	\$17,740	\$490,361
Turkey Point Unit No. 4	530,700	0	19,956	550,656
St Lucie Unit No. 1	554,699	0	21,038	575,736
St Lucie Unit No. 2	451,051	0	17,340	468,391
Total	<u><u>\$2,009,070</u></u>	<u><u>\$0</u></u>	<u><u>\$76,074</u></u>	<u><u>\$2,085,144</u></u>

December 31, 2011

<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$151,002	\$0	\$5,834	\$156,835
Turkey Point Unit No. 4	161,779	0	6,252	168,031
St Lucie Unit No. 1	136,066	0	5,256	141,322
St Lucie Unit No. 2	66,199	0	2,568	68,767
Total	<u>\$515,046</u>	<u>\$0</u>	<u>\$19,910</u>	<u>\$534,956</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$339,359	\$0	\$9,987	\$349,346
Turkey Point Unit No. 4	388,877	0	11,437	400,314
St Lucie Unit No. 1	439,670	0	12,928	452,598
St Lucie Unit No. 2	402,191	0	11,813	414,005
Total	<u>\$1,570,097</u>	<u>\$0</u>	<u>\$46,165</u>	<u>\$1,616,262</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$490,361	\$0	\$15,821	\$506,182
Turkey Point Unit No. 4	550,656	0	17,689	568,345
St Lucie Unit No. 1	575,736	0	18,184	593,920
St Lucie Unit No. 2	468,390	0	14,382	482,772
Total	<u><u>\$2,085,143</u></u>	<u><u>\$0</u></u>	<u><u>\$66,075</u></u>	<u><u>\$2,151,218</u></u>

(1) Balances exclude unrealized market gains/losses.

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Fund Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

	<u>Beginning Balance</u>	<u>Contribution</u>	<u>Fund Earnings</u>	<u>Ending Balance</u>
<u>December 31, 2012</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$156,835	\$0	\$5,789	\$162,624
Turkey Point Unit No. 4	168,031	0	6,204	174,234
St Lucie Unit No. 1	141,322	0	5,216	146,538
St Lucie Unit No. 2	68,767	0	2,549	71,316
Total	<u>\$534,956</u>	<u>\$0</u>	<u>\$19,757</u>	<u>\$554,713</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$349,346	\$0	\$17,029	\$366,375
Turkey Point Unit No. 4	400,314	0	19,503	419,817
St Lucie Unit No. 1	452,598	0	22,050	474,648
St Lucie Unit No. 2	414,005	0	20,147	434,151
Total	<u>\$1,616,262</u>	<u>\$0</u>	<u>\$78,729</u>	<u>\$1,694,991</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$506,182	\$0	\$22,818	\$528,999
Turkey Point Unit No. 4	568,345	0	25,706	594,051
St Lucie Unit No. 1	593,920	0	27,266	621,186
St Lucie Unit No. 2	482,772	0	22,696	505,468
Total	<u><u>\$2,151,218</u></u>	<u><u>\$0</u></u>	<u><u>\$98,486</u></u>	<u><u>\$2,249,704</u></u>
<u>December 31, 2013</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$162,624	\$0	\$5,722	\$168,346
Turkey Point Unit No. 4	174,234	0	6,132	180,366
St Lucie Unit No. 1	146,538	0	5,155	151,694
St Lucie Unit No. 2	71,316	0	2,519	73,835
Total	<u>\$554,713</u>	<u>\$0</u>	<u>\$19,527</u>	<u>\$574,240</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$366,375	\$0	\$31,896	\$398,271
Turkey Point Unit No. 4	419,817	0	36,516	456,333
St Lucie Unit No. 1	474,648	0	41,270	515,918
St Lucie Unit No. 2	434,151	0	37,728	471,879
Total	<u>\$1,694,991</u>	<u>\$0</u>	<u>\$147,410</u>	<u>\$1,842,401</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$528,999	\$0	\$37,617	\$566,617
Turkey Point Unit No. 4	594,051	0	42,648	636,699
St Lucie Unit No. 1	621,186	0	46,425	667,612
St Lucie Unit No. 2	505,468	0	40,247	545,714
Total	<u><u>\$2,249,704</u></u>	<u><u>\$0</u></u>	<u><u>\$166,937</u></u>	<u><u>\$2,416,641</u></u>

(1) Balances exclude unrealized market gains/losses.

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Fund Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

	Beginning Balance	Contribution	Fund Earnings	Ending Balance
<u>December 31, 2014</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$168,346	\$0	\$6,106	\$174,452
Turkey Point Unit No. 4	180,366	0	6,544	186,910
St Lucie Unit No. 1	151,694	0	5,502	157,196
St Lucie Unit No. 2	73,835	0	2,689	76,524
Total	<u>\$574,240</u>	<u>\$0</u>	<u>\$20,841</u>	<u>\$595,081</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$398,271	\$0	\$15,096	\$413,367
Turkey Point Unit No. 4	456,333	0	17,302	473,635
St Lucie Unit No. 1	515,918	0	19,575	535,493
St Lucie Unit No. 2	471,879	0	17,857	489,737
Total	<u>\$1,842,401</u>	<u>\$0</u>	<u>\$69,830</u>	<u>\$1,912,231</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$566,617	\$0	\$21,202	\$587,819
Turkey Point Unit No. 4	636,699	0	23,846	660,545
St Lucie Unit No. 1	667,612	0	25,077	692,689
St Lucie Unit No. 2	545,714	0	20,546	566,260
Total	<u><u>\$2,416,641</u></u>	<u><u>\$0</u></u>	<u><u>\$90,672</u></u>	<u><u>\$2,507,313</u></u>
<u>November 30, 2015</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$174,452	\$0	\$5,582	\$180,034
Turkey Point Unit No. 4	186,910	0	5,982	192,892
St Lucie Unit No. 1	157,196	0	5,030	162,225
St Lucie Unit No. 2	76,524	0	2,458	78,981
Total	<u>\$595,081</u>	<u>\$0</u>	<u>\$19,051</u>	<u>\$614,133</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$413,367	\$0	\$15,892	\$429,259
Turkey Point Unit No. 4	473,635	0	18,207	491,842
St Lucie Unit No. 1	535,493	0	20,585	556,078
St Lucie Unit No. 2	489,737	0	18,805	508,541
Total	<u>\$1,912,231</u>	<u>\$0</u>	<u>\$73,489</u>	<u>\$1,985,720</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$587,819	\$0	\$21,474	\$609,293
Turkey Point Unit No. 4	660,545	0	24,189	684,734
St Lucie Unit No. 1	692,689	0	25,614	718,303
St Lucie Unit No. 2	566,260	0	21,262	587,523
Total	<u><u>\$2,507,313</u></u>	<u><u>\$0</u></u>	<u><u>\$92,540</u></u>	<u><u>\$2,599,853</u></u>

(1) Balances exclude unrealized market gains/losses.

SECTION 5

SUPPORT SCHEDULE C  
Projected Fund and Reserve Balance  
At December 31, 2015

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Projected Fund and Reserve Balance at December 31, 2015<sup>(a)</sup>  
\$000

	TURKEY POINT UNIT 3	TURKEY POINT UNIT 4	ST. LUCIE UNIT 1	ST. LUCIE UNIT 2 (Note 1)	TOTALS
<b>NON-QUALIFIED FUND</b>					
Actual Fund Balance @ 11/30/15	\$180,034	\$192,892	\$162,225	\$78,981	\$614,133
Add: Estimate Income Dec. 2015 (after-tax)	507	544	457	223	1,732
Est/Actual Fund Balance @ 12/31/15	<u>\$180,542</u>	<u>\$193,436</u>	<u>\$162,682</u>	<u>\$79,205</u>	<u>\$615,865</u>
<b>QUALIFIED FUND</b>					
Actual Fund Balance @ 11/30/15	\$429,259	\$491,842	\$556,078	\$508,541	\$1,985,720
Add: Estimate Income Dec. 2015 (after-tax)	1,445	1,655	1,871	1,710	6,681
Est/Actual Fund Balance @ 12/31/15	<u>\$430,704</u>	<u>\$493,497</u>	<u>\$557,949</u>	<u>\$510,251</u>	<u>\$1,992,401</u>
<b>TOTAL FUND</b>					
Actual Fund Balance @ 11/30/15	\$609,293	\$684,734	\$718,303	\$587,523	\$2,599,853
Add: Estimate Income Dec. 2015 (after-tax)	1,952	2,199	2,329	1,933	8,413
Est/Actual Fund Balance @ 12/31/15	<u>\$611,246</u>	<u>\$686,933</u>	<u>\$720,631</u>	<u>\$589,456</u>	<u>\$2,608,266</u>
<b>NON-QUALIFIED RESERVE</b>					
Actual Reserve Balance@ 11/30/15	\$293,096	\$314,029	\$264,103	\$128,581	\$999,810
Add: Estimate Income Dec. 2015	826	885	744	364	2,820
Est/Actual Reserve Balance@12/31/15	<u>\$293,922</u>	<u>\$314,915</u>	<u>\$264,847</u>	<u>\$128,945</u>	<u>\$1,002,630</u>
<b>QUALIFIED RESERVE</b>					
Actual Reserve Balance@ 11/30/15	\$429,259	\$491,842	\$556,078	\$508,542	\$1,985,720
Add: Estimate Income Dec. 2015	1,445	1,655	1,871	1,710	6,681
Est/Actual Reserve Balance@12/31/15	<u>\$430,704</u>	<u>\$493,497</u>	<u>\$557,949</u>	<u>\$510,251</u>	<u>\$1,992,401</u>
<b>TOTAL RESERVE</b>					
Actual Reserve Balance@ 11/30/15	\$722,355	\$805,871	\$820,181	\$637,123	\$2,985,530
Add: Estimate Income Dec. 2015	2,271	2,541	2,616	2,073	9,500
Est/Actual Reserve Balance@12/31/15	<u>\$724,626</u>	<u>\$808,412</u>	<u>\$822,796</u>	<u>\$639,196</u>	<u>\$2,995,031</u>

(a) Balances exclude unrealized market gains/losses.

Note (1): Amounts for St Lucie Common are included with Unit No. 2

SECTION 6

SUPPORT SCHEDULE D  
Reconciliation of Projected Fund and Reserve Balance  
At December 31, 2015

Florida Power & Light Company  
2015 Decommissioning Study

Support Schedule: Reconciliation of Projected Fund and Reserve Balance at December 31, 2015<sup>(a)</sup>  
\$000

**RECONCILIATION FUND/RESERVE**  
**Projected 12/31/2015**

	TURKEY POINT UNIT 3	TURKEY POINT UNIT 4	ST. LUCIE UNIT 1	ST. LUCIE UNIT 2 (Note 1)	TOTALS
<b>NON-QUALIFIED</b>					
Projected Fund Balance @12/31/15	\$180,542	\$193,436	\$162,682	\$79,205	\$615,865
Deferred Tax @ 12/31/15	113,381	121,479	102,165	49,740	386,765
Projected Reserve Balance @ 12/31/15	<u>\$293,922</u>	<u>\$314,915</u>	<u>\$264,847</u>	<u>\$128,945</u>	<u>\$1,002,630</u>
<b>QUALIFIED</b>					
Projected Fund Balance @12/31/15	\$430,704	\$493,497	\$557,949	\$510,251	\$1,992,401
Deferred Tax @ 12/31/15	0	0	0	0	0
Projected Reserve Balance @ 12/31/15	<u>\$430,704</u>	<u>\$493,497</u>	<u>\$557,949</u>	<u>\$510,251</u>	<u>\$1,992,401</u>
<b>TOTAL</b>					
Projected Fund Balance @12/31/15	\$611,246	\$686,933	\$720,631	\$589,456	\$2,608,266
Deferred Tax @ 12/31/15	113,381	121,479	102,165	49,740	386,765
Projected Reserve Balance @ 12/31/15	<u>\$724,626</u>	<u>\$808,412</u>	<u>\$822,796</u>	<u>\$639,196</u>	<u>\$2,995,031</u>

**DEFERRED TAXES**  
**Projected balance @ 12/31/15**

<b>NON-QUALIFIED FUND</b>					
Balance @ 11/30/15 (Fed & State)	\$113,062	\$121,137	\$101,878	\$49,600	\$385,677
Add: Tax on Earnings - December	319	342	287	140	1,088
Balance @ 12/31/15 (Fed & State)	<u>\$113,381</u>	<u>\$121,478</u>	<u>\$102,165</u>	<u>\$49,741</u>	<u>\$386,764</u>

(a) Balances exclude unrealized market gains/losses.

Note (1): Amounts for St Lucie Common are included with Unit No. 2

SECTION 7

SUPPORT SCHEDULE E  
End-of-Life Materials and Supplies Inventory  
Expense Accrual Calculation

**Florida Power and Light Company  
2015 Decommissioning Study  
Support Schedule: End-of-Life Materials and Supplies Inventory**

	<b>St. Lucie Unit 2</b>
Adjusted Ending Inventory Value @ End of License	\$ 27,154,326
Estimated Salvage	(259,706)
<b>Inventory Subject to Write-off</b>	<b><u>\$ 26,894,620</u></b>
<b>FPL's Ownership Share Net of Participants</b>	<b>\$ 24,891,575</b>
Actual Reserve Balance Accrued as of 12/31/15	<u>5,758,633</u>
<b>Remaining Amount to be Recovered as of 12/31/15</b>	<b><u>\$ 19,132,941</u></b>
Total Number of Months From: 12/31/15 to End of License 4/6/2043	 327.5

- (1) The Participants' obligation is assumed to be treated the same as "Common Facility Cost" which is calculated at one-half their ownership percentage. ( $0.5 * 14.89551\% = 7.447755\%$ ) Therefore, FPL's ownership share is 92.552245%.

SECTION 8

SUPPORT SCHEDULE F  
End-of-Life Unamortized Nuclear Fuel  
Expense Accrual Calculation

**Florida Power and Light Company**  
**2015 Decommissioning Study**  
**Support Schedule: End-of-Life Unamortized Nuclear Fuel**

<u>Line</u> <u>Number</u>		<u>St. Lucie</u> <u>Unit 1</u>	<u>St. Lucie</u> <u>Unit 2</u>
1	<b>Estimated Cost of Unburned Fuel @ End of License</b>		
2	<b>FPL's Ownership Share Net of Participants</b>	<b>\$ 89,300,000</b>	<b>\$ 98,700,000</b>
3			
4	Actual Reserve Balance at 12/31/2015	24,907,651	17,878,608
5			
6	<b>Remaining Amount to be Recovered as of 12/31/2015</b>	<b>\$ 64,392,349</b>	<b>\$ 80,821,392</b>
7			
8			
9	Total Number of Months From:		
10	<b>12/31/15 to End of License:</b>	242.5	327.5
11			

**SECTION 9**

**SUPPORT SCHEDULE G  
Inflation of Funding Analysis**

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule : Inflation and Funding Analysis

**INFLATION FORECAST**

The U.S. Economy  
30 Year Outlook (Aug 2015)  
GLOBAL INSIGHT

YEAR	GDP	HRLY COMP	PPI INT M&S	GDP Transport	Burial	CPI	CPI MULTIPLIER
2015	1.1%	2.7%	-7.3%	3.7%	3.2%	-0.2%	1.000
2016	2.0%	3.5%	0.9%	5.8%	3.2%	2.0%	1.020
2017	2.0%	3.7%	2.6%	5.5%	3.2%	2.5%	1.046
2018	1.9%	3.9%	2.4%	4.3%	3.2%	2.6%	1.073
2019	2.0%	3.9%	2.0%	3.5%	3.2%	2.5%	1.100
2020	1.9%	3.9%	0.5%	3.2%	3.2%	2.7%	1.129
2021	2.0%	3.9%	1.1%	3.1%	3.2%	2.3%	1.155
2022	2.1%	3.9%	1.9%	2.9%	3.2%	2.6%	1.185
2023	2.2%	3.9%	2.0%	2.6%	3.2%	2.6%	1.216
2024	2.1%	4.0%	1.4%	2.5%	3.2%	2.5%	1.247
2025	2.1%	4.0%	0.9%	2.6%	3.2%	2.4%	1.277
2026	2.1%	3.9%	0.8%	2.8%	3.2%	2.3%	1.307
2027	2.1%	3.9%	1.0%	3.2%	3.2%	2.3%	1.338
2028	2.1%	3.9%	1.2%	3.4%	3.2%	2.3%	1.369
2029	2.1%	3.8%	1.1%	3.7%	3.2%	2.3%	1.400
2030	2.1%	3.8%	1.0%	3.8%	3.2%	2.3%	1.432
2031	2.2%	3.9%	1.2%	4.0%	3.2%	2.3%	1.466
2032	2.2%	3.9%	0.9%	4.2%	3.2%	2.3%	1.500
2033	2.2%	3.9%	1.0%	4.4%	3.2%	2.3%	1.535
2034	2.2%	3.9%	1.1%	4.5%	3.2%	2.4%	1.571
2035	2.2%	3.9%	1.0%	4.5%	3.2%	2.4%	1.608
2036	2.2%	3.9%	1.0%	4.7%	3.2%	2.3%	1.646
2037	2.2%	3.9%	1.1%	4.7%	3.2%	2.4%	1.685
2038	2.2%	3.9%	1.1%	4.7%	3.2%	2.4%	1.725
2039	2.3%	3.9%	1.2%	4.8%	3.2%	2.5%	1.768
2040	2.3%	3.9%	1.2%	4.8%	3.2%	2.4%	1.811
2041	2.3%	3.9%	1.2%	4.8%	3.2%	2.4%	1.855
2042	2.3%	3.9%	1.2%	4.8%	3.2%	2.5%	1.901
2043	2.3%	3.9%	1.2%	4.8%	3.2%	2.5%	1.948
2044	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	1.996
2045	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.046
2046	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.097
2047	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.149
2048	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.203
2049	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.258
2050	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.314
2051	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.371
2052	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.430
2053	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.491
2054	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.553
2055	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.616
2056	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.682
2057	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.748
2058	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.817
2059	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.887
2060	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.959
2061	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.032
2062	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.108
2063	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.185
2064	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.265
2065	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.346
2066	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.429
2067	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.514
2068	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.602
2069	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.692
2070	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.784
2071	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.878
2072	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.974
2073	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.073
2074	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.175
2075	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.279
2076	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.385
2077	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.494
2078	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.606
2079	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.721
2080	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.838

2.45% = AVERAGE COMPOUND CPI INFLATION MULTILPLIER 2016-2074

**Florida Power & Light Company**  
**2015 Decommissioning Study**  
**Support Schedule : Inflation and Funding Analysis**

**Support Schedule G**  
**Page 2 of 8**

**GENERAL ASSUMPTIONS**

JURISDICTIONAL FACTOR =		94.6310%			
FPL'S SHARE OF ST. LUCIE 2 COST (NET OF PARTICIPANTS)		85.14933%			
CORPORATE TAX RATE		38.575%			
			ANNUAL	MONTHLY	
EARNINGS RATE QUALIFIED FUND			3.700%	0.303225%	
EARNINGS RATE NON-QUALIFIED FUND			3.700%	0.303225%	
	TP3	TP4	SL1	SL2	
Adjusted QUALIFIED FUNDING % (at 12/31/15)	59.438%	61.045%	67.811%	79.827%	
<b>FUND BALANCES (\$000's)</b>					
A. QUALIFIED FUND BALANCE 11/30/15	429,259	491,842	556,078	508,541	
B. CONTRIBUTIONS - Dec 2015	-	-	-	-	
C. EARNINGS - Dec 2015	1,445	1,655	1,871	1,710	
D. QUALIFIED FUND BALANCE 12/31/15	430,704	493,497	557,949	510,251	
E. JURISDICTIONAL FACTOR	94.6310%	94.6310%	94.6310%	94.6310%	
F. JURIS. QUAL. FUND BAL. 12/31/15	407,579	467,001	527,993	482,855	
A. NON-QUALIFIED FUND BALANCE 11/30/15	180,034	192,892	162,225	78,981	
B. CONTRIBUTIONS - Dec 2015	-	-	-	-	
C. EARNINGS - Dec 2015	507	544	457	223	
D. NON-QUALIFIED FUND BALANCE 12/31/15	180,542	193,436	162,682	79,205	
E. JURISDICTIONAL FACTOR	94.6310%	94.6310%	94.6310%	94.6310%	
F. JURIS. NON-QUAL. FUND BAL. 12/31/15	170,848	183,050	153,948	74,952	
	Juris. Est/Actual Fund Balance	578,428	650,052	681,941	557,807
	Juris. Est/Actual Reserve Balance	685,721	765,008	778,621	604,877
	Adjusted/Actual Qualified split	0.5944	0.6105	0.6781	0.7983

Florida Power & Light Company  
2015 Decommissioning Study  
St. Lucie Nuclear Units

Support Schedule : Inflation and Funding Analysis

St. Lucie Nuclear Plant, Unit 1 Integrated DECON - Total Decommissioning Cost (thousands, 2015 dollars)							St. Lucie Nuclear Plant, Unit 1 Integrated DECON - Total Decommissioning Cost (thousands, Future dollars)							Average Inflation Rate
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals	Year	Labor	Equipment & Materials	Transport	Burial	Other	Yearly Totals	
2036	40,602	5,906	2,896	37	6,237	55,677	2036	89,896	7,730	6,294	71	9,643	113,634	3.50%
2037	39,414	9,467	2,530	1,232	19,636	72,279	2037	90,651	12,527	5,760	2,463	31,034	142,435	3.10%
2038	16,644	11,926	691	15	4,554	33,830	2038	39,772	15,956	1,647	32	7,360	64,767	2.90%
2039	16,644	11,926	691	15	4,554	33,830	2039	41,318	16,146	1,726	33	7,527	66,749	2.90%
2040	16,690	11,958	693	15	4,567	33,923	2040	43,042	16,379	1,814	34	7,719	68,988	2.90%
2041	13,270	10,401	575	12	4,202	28,462	2041	35,560	14,413	1,579	28	7,267	58,847	2.80%
2042	6,550	7,365	345	6	3,501	17,768	2042	18,237	10,325	993	14	6,195	35,763	2.60%
2043	6,550	7,365	345	6	3,501	17,768	2043	18,947	10,447	1,041	14	6,340	36,789	2.60%
2044	21,764	3,414	2,544	25	3,002	30,748	2044	65,409	4,901	8,030	61	5,563	83,964	3.50%
2045	40,319	11,666	3,418	12,437	4,965	72,804	2045	125,897	16,946	11,310	31,996	9,418	195,568	3.30%
2046	53,163	22,056	3,281	23,136	10,812	112,448	2046	172,474	32,418	11,385	61,427	20,994	298,698	3.20%
2047	49,174	14,835	2,929	21,250	11,651	99,840	2047	165,750	22,064	10,655	58,225	23,156	279,851	3.30%
2048	45,459	7,908	2,598	19,488	12,493	87,946	2048	159,201	11,901	9,906	55,106	25,414	261,529	3.40%
2049	33,319	5,427	1,471	8,004	6,919	55,141	2049	121,234	8,263	5,883	23,357	14,408	173,145	3.40%
2050	17,275	8,957	402	5	1,564	28,203	2050	65,305	13,802	1,686	14	3,332	84,140	3.20%
2051	15,768	9,990	345	-	1,270	27,373	2051	61,931	15,575	1,518	-	2,771	81,795	3.10%
2052	2,968	1,197	11	-	1,272	5,448	2052	12,113	1,888	52	-	2,840	16,893	3.10%
2053	2,526	895	-	-	1,268	4,690	2053	10,709	1,429	-	-	2,899	15,038	3.10%
2054	2,526	895	-	-	1,268	4,690	2054	11,127	1,446	-	-	2,967	15,540	3.10%
2055	2,526	895	-	-	1,268	4,690	2055	11,561	1,463	-	-	3,037	16,061	3.10%
2056	2,533	898	-	-	1,272	4,702	2056	12,044	1,485	-	-	3,117	16,646	3.10%
2057	2,526	895	-	-	1,268	4,690	2057	12,479	1,498	-	-	3,182	17,160	3.10%
2058	2,526	895	-	-	1,268	4,690	2058	12,966	1,516	-	-	3,257	17,739	3.10%
2059	2,526	895	-	-	1,268	4,690	2059	13,471	1,534	-	-	3,334	18,339	3.10%
2060	2,533	898	-	-	1,272	4,702	2060	14,035	1,557	-	-	3,422	19,013	3.20%
2061	2,526	895	-	-	1,268	4,690	2061	14,542	1,571	-	-	3,493	19,605	3.20%
2062	2,526	895	-	-	1,268	4,690	2062	15,109	1,589	-	-	3,575	20,273	3.20%
2063	2,526	895	-	-	1,268	4,690	2063	15,697	1,608	-	-	3,659	20,965	3.20%
2064	2,533	898	-	-	1,272	4,702	2064	16,354	1,632	-	-	3,756	21,742	3.20%
2065	2,526	895	-	-	1,268	4,690	2065	16,945	1,647	-	-	3,834	22,425	3.20%
2066	2,526	895	-	-	1,268	4,690	2066	17,605	1,666	-	-	3,924	23,196	3.20%
2067	2,526	895	-	-	1,268	4,690	2067	18,292	1,686	-	-	4,017	23,994	3.20%
2068	2,533	898	-	-	1,272	4,702	2068	19,057	1,711	-	-	4,123	24,890	3.20%
2069	2,526	895	-	-	1,268	4,690	2069	19,745	1,726	-	-	4,208	25,680	3.20%
2070	2,526	895	-	-	1,268	4,690	2070	20,515	1,747	-	-	4,308	26,569	3.20%
2071	2,526	895	-	-	1,268	4,690	2071	21,315	1,767	-	-	4,409	27,491	3.20%
2072	2,533	898	-	-	1,272	4,702	2072	22,206	1,793	-	-	4,526	28,525	3.20%
2073	2,504	2,576	4	42	16,568	21,693	2073	22,807	5,205	51	261	60,349	88,672	2.50%
2074	843	829	178	1,227	2,535	5,611	2074	7,976	1,695	2,320	7,868	9,451	29,310	2.80%
<b>Total</b>	<b>489,473</b>	<b>183,090</b>	<b>25,948</b>	<b>86,951</b>	<b>149,186</b>	<b>934,649</b>	<b>Total</b>	<b>1,673,294</b>	<b>270,655</b>	<b>83,650</b>	<b>241,003</b>	<b>333,826</b>	<b>2,602,428</b>	<b>3.11%</b>

**NOTE:** The 2015 cash flows are inflated to the year of expenditure based on the indices provided on Support Schedule G, page 1 of 8

Florida Power & Light Company  
2015 Decommissioning Study  
St. Lucie Nuclear Units

Support Schedule : Inflation and Funding Analysis

St. Lucie Nuclear Plant, Unit 2 DECON - Total Decommissioning Cost (thousands, 2015 dollars)							St. Lucie Nuclear Plant, Unit 2 DECON - Total Decommissioning Cost (thousands, Future dollars)							Average Inflation Rate
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals	Year	Labor	Equipment & Materials	Transport	Burial	Other	Yearly Totals	
2043	45,760	6,120	2,555	32	5,646	60,113	2043	132,366	8,680	7,697	78	10,223	159,044	3.50%
2044	72,239	20,336	5,173	16,018	16,966	130,733	2044	217,107	29,194	16,331	39,932	31,443	334,007	3.30%
2045	70,021	28,345	3,281	25,529	12,259	139,435	2045	218,643	41,174	10,859	65,678	23,254	359,609	3.20%
2046	57,548	24,197	2,882	19,445	11,387	115,458	2046	186,700	35,565	9,999	51,626	22,109	306,000	3.20%
2047	48,445	21,169	2,590	15,004	10,750	97,959	2047	163,292	31,484	9,423	41,112	21,366	266,677	3.20%
2048	47,443	20,434	2,482	14,356	10,360	95,074	2048	166,147	30,751	9,464	40,593	21,075	268,031	3.20%
2049	30,854	6,585	975	3,228	4,291	45,932	2049	112,263	10,027	3,897	9,419	8,934	144,541	3.40%
2050	20,686	8,013	402	5	1,986	31,092	2050	78,202	12,346	1,686	15	4,234	96,483	3.30%
2051	19,476	9,160	345	-	1,819	30,800	2051	76,498	14,281	1,518	-	3,967	96,264	3.20%
2052	3,233	1,003	11	-	1,291	5,538	2052	13,193	1,583	52	-	2,883	17,711	3.20%
2053	2,673	724	-	-	1,270	4,666	2053	11,334	1,155	-	-	2,902	15,391	3.20%
2054	2,673	724	-	-	1,270	4,666	2054	11,776	1,169	-	-	2,970	15,915	3.20%
2055	2,673	724	-	-	1,270	4,666	2055	12,235	1,183	-	-	3,040	16,458	3.20%
2056	2,680	726	-	-	1,273	4,679	2056	12,746	1,200	-	-	3,120	17,067	3.20%
2057	2,673	724	-	-	1,270	4,666	2057	13,207	1,211	-	-	3,185	17,603	3.20%
2058	2,673	724	-	-	1,270	4,666	2058	13,722	1,226	-	-	3,260	18,208	3.20%
2059	2,673	724	-	-	1,270	4,666	2059	14,257	1,240	-	-	3,337	18,834	3.20%
2060	2,680	726	-	-	1,273	4,679	2060	14,853	1,258	-	-	3,425	19,536	3.20%
2061	2,673	724	-	-	1,270	4,666	2061	15,390	1,270	-	-	3,496	20,156	3.20%
2062	2,673	724	-	-	1,270	4,666	2062	15,989	1,285	-	-	3,579	20,853	3.20%
2063	2,673	724	-	-	1,270	4,666	2063	16,613	1,300	-	-	3,663	21,576	3.20%
2064	2,680	726	-	-	1,273	4,679	2064	17,307	1,319	-	-	3,760	22,386	3.20%
2065	2,673	724	-	-	1,270	4,666	2065	17,933	1,331	-	-	3,838	23,102	3.30%
2066	2,673	724	-	-	1,270	4,666	2066	18,632	1,347	-	-	3,928	23,907	3.30%
2067	2,673	724	-	-	1,270	4,666	2067	19,358	1,363	-	-	4,021	24,742	3.30%
2068	2,680	726	-	-	1,273	4,679	2068	20,168	1,383	-	-	4,127	25,677	3.30%
2069	2,673	724	-	-	1,270	4,666	2069	20,897	1,395	-	-	4,213	26,505	3.30%
2070	2,673	724	-	-	1,270	4,666	2070	21,711	1,412	-	-	4,312	27,435	3.30%
2071	2,673	724	-	-	1,270	4,666	2071	22,557	1,429	-	-	4,414	28,400	3.30%
2072	2,680	726	-	-	1,273	4,679	2072	23,501	1,450	-	-	4,530	29,480	3.30%
2073	2,652	2,413	4	42	15,582	20,692	2073	24,154	4,875	51	261	56,758	86,099	2.50%
2074	843	829	178	1,227	2,535	5,611	2074	7,976	1,695	2,320	7,868	9,451	29,310	2.80%
<b>Total</b>	<b>472,699</b>	<b>163,089</b>	<b>20,880</b>	<b>94,885</b>	<b>120,279</b>	<b>871,831</b>	<b>Total</b>	<b>1,730,727</b>	<b>247,581</b>	<b>73,298</b>	<b>256,581</b>	<b>288,816</b>	<b>2,597,003</b>	<b>3.21%</b>

**NOTE:** The 2015 cash flows are inflated to the year of expenditure based on the indices provided on Support Schedule G, page 1 of 8

**Florida Power & Light Company  
2015 Decommissioning Study  
St. Lucie Nuclear Units**

**Support Schedule : Inflation and Funding Analysis**

St. Lucie Nuclear Plant, Unit 1 Integrated DECON Costs Recovered for Spent Fuel Management (thousands, 2015 dollars)							St. Lucie Nuclear Plant, Unit 1 Integrated DECON Costs Recovered for Spent Fuel Management (thousands, Future dollars)						
Year	Labor	Equipment & Materials	LLRW Energy Disposal	Other	Yearly Totals		Year	Labor	Equipment & Materials	Transport	Burial	Other	Yearly Totals
2036	-	-	-	-	-		2036	-	-	-	-	-	-
2037	1,596	4,787	-	-	47	6,429	2037	3,670	6,334	-	-	75	10,078
2038	1,597	4,792	-	-	56	6,445	2038	3,817	6,411	-	-	91	10,319
2039	3,858	11,574	-	-	56	15,489	2039	9,577	15,670	-	-	93	25,341
2040	3,858	11,574	-	-	56	15,489	2040	9,950	15,853	-	-	95	25,898
2041	3,869	11,606	-	-	56	15,531	2041	10,367	16,083	-	-	98	26,547
2042	3,362	10,085	-	-	225	13,671	2042	9,359	14,137	-	-	398	23,894
2043	2,372	7,117	-	-	561	10,050	2043	6,862	10,095	-	-	1,015	17,973
2044	2,372	7,117	-	-	561	10,050	2044	7,130	10,217	-	-	1,039	18,386
2045	702	2,106	-	-	562	3,370	2045	2,192	3,059	-	-	1,066	6,317
2046	-	-	-	-	561	561	2046	-	-	-	-	1,088	1,088
2047	-	-	-	-	561	561	2047	-	-	-	-	1,114	1,114
2048	103	310	-	-	561	974	2048	362	467	-	-	1,140	1,969
2049	203	610	-	-	562	1,376	2049	740	929	-	-	1,170	2,839
2050	587	1,761	-	-	561	2,909	2050	2,219	2,714	-	-	1,195	6,128
2051	1,552	1,720	-	-	802	4,075	2051	6,097	2,682	-	-	1,750	10,529
2052	1,689	1,554	-	-	850	4,093	2052	6,894	2,451	-	-	1,898	11,243
2053	2,505	920	-	-	1,258	4,683	2053	10,622	1,468	-	-	2,875	14,965
2054	2,526	895	-	-	1,268	4,690	2054	11,127	1,446	-	-	2,967	15,540
2055	2,526	895	-	-	1,268	4,690	2055	11,561	1,463	-	-	3,037	16,061
2056	2,526	895	-	-	1,268	4,690	2056	12,011	1,481	-	-	3,109	16,601
2057	2,533	898	-	-	1,272	4,702	2057	12,514	1,502	-	-	3,191	17,207
2058	2,526	895	-	-	1,268	4,690	2058	12,966	1,516	-	-	3,257	17,739
2059	2,526	895	-	-	1,268	4,690	2059	13,471	1,534	-	-	3,334	18,339
2060	2,526	895	-	-	1,268	4,690	2060	13,996	1,552	-	-	3,412	18,961
2061	2,533	898	-	-	1,272	4,702	2061	14,582	1,575	-	-	3,502	19,659
2062	2,526	895	-	-	1,268	4,690	2062	15,109	1,589	-	-	3,575	20,273
2063	2,526	895	-	-	1,268	4,690	2063	15,697	1,608	-	-	3,659	20,965
<b>Total</b>	<b>55,499</b>	<b>86,591</b>	-	-	<b>20,585</b>	<b>162,675</b>	<b>Total</b>	<b>222,890</b>	<b>123,838</b>	-	-	<b>49,244</b>	<b>395,972</b>

**NOTE:** The 2015 cash flows are inflated to the year of expenditure based on the indices provided on Support Schedule G, page 1 of 8

Florida Power & Light Company  
2015 Decommissioning Study  
St. Lucie Nuclear Units

Support Schedule : Inflation and Funding Analysis

St. Lucie Nuclear Plant, Unit 2 DECON Costs Recovered for Spent Fuel Management (thousands, 2015 dollars)							St. Lucie Nuclear Plant, Unit 2 DECON Costs Recovered for Spent Fuel Management (thousands, Future dollars)						
Year	Labor	Equipment & Materials	LLRW Energy Disposal	Other	Yearly Totals		Year	Labor	Equipment & Materials	Transport	Burial	Other	Yearly Totals
2043	-	-	-	-	-	-	2043	-	-	-	-	-	-
2044	1,584	4,751	-	-	42	6,376	2044	4,760	6,821	-	-	77	11,657
2045	1,607	4,820	-	-	56	6,483	2045	5,017	7,001	-	-	107	12,125
2046	1,462	4,386	-	-	56	5,905	2046	4,743	6,447	-	-	109	11,300
2047	3,268	9,803	-	-	56	13,127	2047	11,014	14,579	-	-	112	25,705
2048	4,585	13,756	-	-	56	18,398	2048	16,058	20,702	-	-	115	36,874
2049	4,371	13,114	-	-	105	17,589	2049	15,905	19,969	-	-	218	36,092
2050	1,111	3,333	-	-	561	5,005	2050	4,201	5,136	-	-	1,195	10,532
2051	55	166	-	-	960	1,182	2051	218	259	-	-	2,094	2,571
2052	-	-	-	-	1,038	1,038	2052	-	-	-	-	2,319	2,319
2053	2,593	702	-	-	1,265	4,560	2053	10,992	1,121	-	-	2,892	15,005
2054	2,673	724	-	-	1,270	4,666	2054	11,776	1,169	-	-	2,970	15,915
2055	2,673	724	-	-	1,270	4,666	2055	12,235	1,183	-	-	3,040	16,458
2056	2,673	724	-	-	1,270	4,666	2056	12,712	1,197	-	-	3,112	17,020
2057	2,680	726	-	-	1,273	4,679	2057	13,243	1,215	-	-	3,194	17,652
2058	2,673	724	-	-	1,270	4,666	2058	13,722	1,226	-	-	3,260	18,208
2059	2,673	724	-	-	1,270	4,666	2059	14,257	1,240	-	-	3,337	18,834
2060	2,673	724	-	-	1,270	4,666	2060	14,812	1,255	-	-	3,416	19,483
2061	2,680	726	-	-	1,273	4,679	2061	15,432	1,273	-	-	3,506	20,211
2062	2,673	724	-	-	1,270	4,666	2062	15,989	1,285	-	-	3,579	20,853
2063	2,673	724	-	-	1,270	4,666	2063	16,613	1,300	-	-	3,663	21,576
<b>Total</b>	<b>47,382</b>	<b>62,074</b>	-	-	<b>16,898</b>	<b>126,353</b>	<b>Total</b>	<b>213,697</b>	<b>94,377</b>	-	-	<b>42,314</b>	<b>350,388</b>

**NOTE:** The 2015 cash flows are inflated to the year of expenditure based on the indices provided on Support Schedule G, page 1 of 8

Florida Power & Light Company  
2015 Decommissioning Study  
St Lucie Nuclear Units  
Support Schedule - Inflation and Funding Analysis

**ST. LUCIE UNIT 1**

	<b>NOMINAL ANNUAL</b>	<b>NOMINAL MONTHLY</b>
EARNINGS RATE QUALIFIED FUND	3.700%	0.303225%
EARNINGS RATE NON-QUALIFIED FUND	3.700%	0.303225%
CORPORATE TAX RATE	38.575%	
FPL'S SHARE OF COST (NET OF PARTICIPANTS)	100.000%	
JURISDICTIONAL FACTOR	94.6310%	
Adjusted QUALIFIED %	67.811%	
LICENSE ENDS MONTHS TO FUND	03/01/2036 242.5	

YEAR	SPENDING CURVE	ESTIMATED COST IN (\$2015)	ESTIMATED COST IN NOMINAL \$	ESTIMATED DOE RECOVERY NOMINAL \$	NET NOMINAL \$	JURISDICTIONAL AMOUNT	QUALIFIED AMOUNT	NON-QUAL AMOUNT	TAX SAVINGS	PV @ 3.7% QUALIFIED AMOUNT	PV @ 3.7% NON-QUAL AMOUNT
2036	5.9570%	\$ 55,677,172	\$ 113,634,081	\$ -	\$ 113,634,081	\$ 107,533,067	\$ 72,919,615	\$ 21,261,313	\$ 13,352,139	\$ 34,000,906	\$ 9,913,710
2037	7.7333%	72,279,105	142,434,747	10,077,793	132,356,954	125,250,709	84,934,186	24,764,425	15,552,099	38,190,020	11,135,138
2038	3.6196%	33,830,439	64,767,120	10,318,610	54,448,510	51,525,169	34,939,908	10,187,497	6,397,764	15,149,921	4,417,292
2039	3.6196%	33,830,439	66,749,066	25,340,649	41,408,417	39,185,199	26,572,009	7,747,652	4,865,538	11,110,516	3,239,515
2040	3.6295%	33,923,125	68,988,383	25,897,900	43,090,483	40,776,955	27,651,400	8,062,372	5,063,183	11,149,316	3,250,828
2041	3.0452%	28,461,642	58,846,811	26,547,056	32,299,755	30,565,581	20,726,931	6,043,391	3,795,260	8,059,115	2,349,812
2042	1.9010%	17,768,054	35,763,326	23,893,585	11,869,741	11,232,455	7,616,878	2,220,868	1,394,709	2,855,950	832,715
2043	1.9010%	17,768,054	36,788,989	17,972,564	18,816,425	17,806,171	12,074,604	3,520,615	2,210,952	4,365,839	1,272,956
2044	3.2898%	30,747,761	83,963,827	18,386,037	65,577,790	62,056,918	42,081,629	12,269,822	7,705,468	14,672,652	4,278,133
2045	7.7895%	72,803,995	195,567,817	6,317,212	189,250,605	179,089,740	121,443,154	35,409,415	22,237,170	40,832,911	11,905,731
2046	12.0311%	112,448,465	298,698,251	1,088,423	297,609,829	281,631,157	190,977,865	55,683,785	34,969,507	61,921,517	18,054,576
2047	10.6821%	99,839,875	279,851,071	1,114,082	278,736,989	263,771,600	178,867,060	52,152,614	32,751,927	55,925,537	16,306,317
2048	9.4095%	87,946,092	261,529,019	1,968,913	259,560,106	245,624,324	166,561,148	48,564,556	30,498,620	50,219,773	14,642,676
2049	5.8996%	55,140,587	173,145,465	2,839,483	170,305,983	161,162,254	109,286,286	31,864,814	20,011,155	31,775,175	9,264,749
2050	3.0175%	28,202,705	84,139,717	6,127,527	78,012,191	73,823,716	50,060,852	14,596,339	9,166,525	14,035,948	4,092,489
2051	2.9287%	27,372,942	81,794,923	10,528,847	71,266,076	67,439,801	45,731,833	13,334,119	8,373,848	12,364,694	3,605,198
2052	0.5829%	5,448,162	16,892,900	11,243,094	5,649,805	5,346,467	3,625,511	1,057,097	663,859	945,269	275,614
2053	0.5017%	4,689,559	15,037,600	14,965,309	72,291	68,410	46,389	13,526	8,494	11,663	3,401
2054	0.5017%	4,689,559	15,540,314	15,540,314	-	-	-	-	-	-	-
2055	0.5017%	4,689,559	16,061,110	16,061,110	-	-	-	-	-	-	-
2056	0.5031%	4,702,407	16,646,144	16,600,663	45,481	43,039	29,186	8,510	5,344	6,580	1,919
2057	0.5017%	4,689,559	17,159,672	17,206,685	(47,013)	(44,489)	(30,168)	(8,796)	(5,524)	(6,559)	(1,912)
2058	0.5017%	4,689,559	17,738,865	17,738,865	-	-	-	-	-	-	-
2059	0.5017%	4,689,559	18,338,997	18,338,997	-	-	-	-	-	-	-
2060	0.5031%	4,702,407	19,012,797	18,960,849	51,948	49,158	33,335	9,720	6,104	6,499	1,895
2061	0.5017%	4,689,559	19,605,236	19,658,949	(53,713)	(50,829)	(34,468)	(10,050)	(6,311)	(6,480)	(1,889)
2062	0.5017%	4,689,559	20,273,000	20,273,000	-	-	-	-	-	-	-
2063	0.5017%	4,689,559	20,965,019	20,965,019	-	-	-	-	-	-	-
2064	0.5031%	4,702,407	21,741,605	-	21,741,605	20,574,298	13,951,708	4,067,926	2,554,664	2,352,168	685,826
2065	0.5017%	4,689,559	22,425,492	-	22,425,492	21,221,468	14,390,562	4,195,884	2,635,022	2,339,591	682,159
2066	0.5017%	4,689,559	23,195,871	-	23,195,871	21,950,484	14,884,918	4,340,024	2,725,542	2,333,619	680,418
2067	0.5017%	4,689,559	23,994,355	-	23,994,355	22,706,098	15,397,309	4,489,423	2,819,365	2,327,821	678,727
2068	0.5031%	4,702,407	24,890,006	-	24,890,006	23,553,661	15,972,054	4,657,003	2,924,605	2,328,556	678,942
2069	0.5017%	4,689,559	25,679,905	-	25,679,905	24,301,150	16,478,936	4,804,795	3,017,419	2,316,735	675,495
2070	0.5017%	4,689,559	26,569,206	-	26,569,206	25,142,705	17,049,606	4,971,186	3,121,913	2,311,441	673,951
2071	0.5017%	4,689,559	27,491,087	-	27,491,087	26,015,090	17,641,182	5,143,673	3,230,235	2,306,308	672,455
2072	0.5031%	4,702,407	28,524,710	-	28,524,710	26,993,218	18,304,463	5,337,068	3,351,687	2,307,639	672,843
2073	2.3210%	21,693,325	88,672,030	-	88,672,030	83,911,229	56,901,330	16,590,831	10,419,069	6,917,586	2,016,974
2074	0.6004%	5,611,264	29,309,923	-	29,309,923	27,736,273	18,808,339	5,483,984	3,443,951	2,204,976	642,909
	100.0000%	\$ 934,648,631	\$ 2,602,428,458	\$ 395,971,535	\$ 2,206,456,923	\$ 2,087,992,251	\$ 1,415,895,549	\$ 412,835,400	\$ 259,261,303	\$ 437,633,199	\$ 127,601,557

	<b>QUALIFIED</b>	<b>NON-QUAL</b>	<b>TOTAL</b>
NPV @12/31/15	\$ 437,633,199	\$ 127,601,557	\$ 565,234,756
LESS BALANCE @ 12/31/15	527,993,021	153,947,945	681,940,965
PV OF FUNDING REQUIREMENTS	\$ (90,359,822)	\$ (26,346,388)	\$ (116,706,209)
MONTHLY FUNDING REQUIREMENT	-	-	-
ANNUAL FUNDING REQUIREMENT	-	-	-
MONTHLY ACCRUAL	-	-	-
ANNUAL ACCRUAL	-	-	-

Florida Power & Light Company  
2015 Decommissioning Study  
St Lucie Nuclear Units  
Support Schedule - Inflation and Funding Analysis

**ST. LUCIE UNIT 2**

	<b>NOMINAL ANNUAL</b>	<b>NOMINAL MONTHLY</b>
EARNINGS RATE QUALIFIED FUND	3.700%	0.303225%
EARNINGS RATE NON-QUALIFIED FUND	3.700%	0.303225%
CORPORATE TAX RATE	38.575%	
FPL'S SHARE OF COST (NET OF PARTICIPANTS)	85.149%	
JURISDICTIONAL FACTOR	94.6310%	
Adjusted QUALIFIED %	79.827%	
LICENSE ENDS	04/06/2043	
MONTHS TO FUND	327.5	

YEAR	SPENDING CURVE	ESTIMATED COST IN (\$2015)	ESTIMATED COST IN NOMINAL \$	ESTIMATED DOE RECOVERY NOMINAL \$	NET NOMINAL \$	JURISDICTIONAL AMOUNT	QUALIFIED AMOUNT	NON-QUAL AMOUNT	TAX SAVINGS	PV @ 3.7% QUALIFIED AMOUNT	PV @ 3.7% NON-QUAL AMOUNT
2043	6.8950%	\$ 60,112,866	\$ 159,043,953	\$ -	\$ 159,043,953	\$ 128,153,900	\$ 102,301,357	\$ 15,879,925	\$ 9,972,619	\$ 36,989,309	\$ 5,741,737
2044	14.9952%	130,732,660	334,006,609	11,657,431	322,349,177	259,741,433	207,343,678	32,185,321	20,212,434	72,294,767	11,222,094
2045	15.9933%	139,434,565	359,608,611	12,125,010	347,483,601	279,994,165	223,510,817	34,694,896	21,788,451	75,151,189	11,665,488
2046	13.2432%	115,458,151	306,000,216	11,299,658	294,700,558	237,462,822	189,559,341	29,424,713	18,478,768	61,461,583	9,540,492
2047	11.2360%	97,958,778	266,676,529	25,705,307	240,971,221	194,168,978	154,999,184	24,060,046	15,109,748	48,462,879	7,522,744
2048	10.9050%	95,073,535	268,030,513	36,874,456	231,156,057	186,260,148	148,685,806	23,080,040	14,494,303	44,830,187	6,958,852
2049	5.2684%	45,931,683	144,540,969	36,091,684	108,449,285	87,385,899	69,757,503	10,828,243	6,800,154	20,282,113	3,148,330
2050	3.5663%	31,092,485	96,482,690	10,531,672	85,951,017	69,257,321	55,286,011	8,581,877	5,389,433	15,500,967	2,406,167
2051	3.5328%	30,800,119	96,263,884	2,570,808	93,693,076	75,495,691	60,265,912	9,354,892	5,874,887	16,294,330	2,529,319
2052	0.6353%	5,538,471	17,710,763	2,318,631	15,392,132	12,402,620	9,900,634	1,536,845	965,141	2,581,363	400,697
2053	0.5353%	4,666,499	15,391,004	15,005,191	385,812	310,879	248,165	38,522	24,192	62,395	9,685
2054	0.5353%	4,666,499	15,914,876	15,914,876	-	-	-	-	-	-	-
2055	0.5353%	4,666,499	16,457,742	16,457,742	-	-	-	-	-	-	-
2056	0.5367%	4,679,283	17,066,944	17,020,313	46,631	37,574	29,994	4,656	2,924	6,763	1,050
2057	0.5353%	4,666,499	17,603,328	17,651,556	(48,228)	(38,861)	(31,022)	(4,815)	(3,024)	(6,745)	(1,047)
2058	0.5353%	4,666,499	18,207,552	18,207,552	-	-	-	-	-	-	-
2059	0.5353%	4,666,499	18,833,780	18,833,780	-	-	-	-	-	-	-
2060	0.5367%	4,679,283	19,536,217	19,482,839	53,378	43,010	34,334	5,330	3,347	6,694	1,039
2061	0.5353%	4,666,499	20,155,587	20,210,807	(55,221)	(44,496)	(35,519)	(5,514)	(3,463)	(6,678)	(1,037)
2062	0.5353%	4,666,499	20,852,912	20,852,912	-	-	-	-	-	-	-
2063	0.5353%	4,666,499	21,575,739	21,575,739	-	-	-	-	-	-	-
2064	0.5367%	4,679,283	22,386,192	-	22,386,192	18,038,270	14,399,402	2,235,175	1,403,693	2,427,646	376,836
2065	0.5353%	4,666,499	23,101,773	-	23,101,773	18,614,868	14,859,683	2,306,623	1,448,563	2,415,860	375,006
2066	0.5353%	4,666,499	23,907,009	-	23,907,009	19,263,709	15,377,632	2,387,023	1,499,054	2,410,865	374,231
2067	0.5353%	4,666,499	24,741,809	-	24,741,809	19,936,371	15,914,598	2,470,374	1,551,399	2,406,026	373,480
2068	0.5367%	4,679,283	25,677,445	-	25,677,445	20,690,285	16,516,425	2,563,794	1,610,067	2,407,919	373,774
2069	0.5353%	4,666,499	26,504,603	-	26,504,603	21,356,789	17,048,475	2,646,382	1,661,932	2,396,805	372,049
2070	0.5353%	4,666,499	27,434,954	-	27,434,954	22,106,445	17,646,902	2,739,274	1,720,269	2,392,417	371,368
2071	0.5353%	4,666,499	28,399,590	-	28,399,590	22,883,726	18,267,382	2,835,589	1,780,755	2,388,174	370,709
2072	0.5367%	4,679,283	29,480,352	-	29,480,352	23,754,579	18,962,557	2,943,499	1,848,522	2,390,605	371,086
2073	2.3734%	20,692,386	86,098,948	-	86,098,948	69,376,520	55,381,164	8,596,648	5,398,709	6,732,777	1,045,108
2074	0.6436%	5,611,264	29,309,923	-	29,309,923	23,617,251	18,852,932	2,926,483	1,837,836	2,210,204	343,083
100.0000%		\$ 871,830,860	\$ 2,597,003,013	\$ 350,387,965	\$ 2,246,615,048	\$ 1,810,269,899	\$ 1,445,083,344	\$ 224,315,841	\$ 140,870,714	\$ 424,490,411	\$ 65,892,340

	QUALIFIED	NON-QUAL	TOTAL
NPV @12/31/15	\$ 424,490,411	\$ 65,892,340	\$ 490,382,752
LESS BALANCE @ 12/31/15	482,855,175	74,952,123	557,807,298
PV OF FUNDING REQUIREMENTS	\$ (58,364,764)	\$ (9,059,783)	\$ (67,424,547)
MONTHLY FUNDING REQUIREMENT	-	-	-
ANNUAL FUNDING REQUIREMENT	-	-	-
MONTHLY ACCRUAL	-	-	-
ANNUAL ACCRUAL	-	-	-

SECTION 10

SUPPORT SCHEDULE H  
St. Lucie Unit No. 2 – FPL Ownership Percentage  
Cost Allocation Analysis

**Florida Power & Light Company**  
**2015 Decommissioning Study**  
**St. Lucie Unit No. 2 - FPL Ownership Percentage**  
**Support Schedule : Cost Allocation Analysis**  
**(thousands 2015 Dollars)**

		<u>2015</u>	
		<u>Base Case</u>	<u>From Pages 3 &amp; 4</u>
1	St. Lucie Unit No. 2	\$871,831	\$39,234 4,134 27
2	St. Lucie Unit No. 2 Common Facilities (Note 1)	<u>43,519</u>	<u>124</u> \$43,519
3	St. Lucie Unit No. 2 Excluding Costs of Common Facilities (L.1 - L.2)	\$828,312	
4	St. Lucie Unit No. 2 Share of Costs of Common Facilities (Note 2)	<u>40,895</u>	\$81,789 / 2
5	Total costs Upon Which Allocation to Participants is Computed (L. 3 + L. 4)	\$869,207	
6	Participants Share of Total Costs (Note 3)	14.89551%	
7	Total Costs Allocated to Participants (L. 5 x L. 6)	\$129,473	
8	Total Costs (line 1 above)	\$871,831	
9	Percent of Total Applicable to Participant(L. 7 / L. 8)	14.85067%	
10	Percent of Total Applicable to FPL Ownership 100% - L. 9	<b>85.14933%</b>	

## Note:

- 1 Common (shared) facilities that are expected to be decommissioned at the same time as St. Lucie Unit No. 2 and are included with the decommissioning costs of Unit No. 2.
- 2 The Participants share of the common facilities has been calculated in compliance with the Participation Agreement which provides that the Participants pay for only their ownership share times one-half of the common facility costs.
- 3 Allocation is based on ownership share of 8.80600% for Florida Municipal Power Agency and 6.08951% for Orlando Utilities Commission. (Total = 14.89551%)

**DECON COST SUMMARY**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,664	16,384	28,048
Removal	102,056	113,647	215,703
Packaging	28,620	30,628	59,248
Transportation	22,428	24,039	46,466
Waste Disposal	86,268	91,914	178,181
Off-site Waste Processing	15,913	17,213	33,126
Program Management <sup>[1]</sup>	294,290	268,532	562,822
Site Security	89,129	92,343	181,472
Spent Fuel Pool Isolation	12,750	8,500	21,250
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	160,006	120,959	280,964
Insurance and Regulatory Fees	26,423	20,824	47,247
Energy	25,948	20,880	46,828
Characterization and Licensing Surveys	19,293	23,852	43,144
Property Taxes	8,603	1,890	10,493
Miscellaneous Equipment	9,098	7,685	16,783
Fixed Overhead	12,984	6,403	19,387
INPO, NEI Fees	6,509	3,678	10,187
Florida LLRW Inspection Fee	2,669	2,462	5,130
<b>Total <sup>[3]</sup></b>	<b>934,649</b>	<b>871,831</b>	<b>1,806,479</b>

Cost Element	Unit 1	Unit 2	Total
License Termination	589,149	619,088	1,208,237
Spent Fuel Management <sup>[4]</sup>	296,190	190,515	486,705
Site Restoration	49,309	62,228	111,537
<b>Total <sup>[3]</sup></b>	<b>934,649</b>	<b>871,831</b>	<b>1,806,479</b>

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

**TABLE 3.5**  
**SUMMARY OF COSTS**  
**SHARED SYSTEMS and STRUCTURES**  
(thousands, 2015 dollars)

	UNIT 1	UNIT 2	TOTAL
<b>STRUCTURES</b>			
Contaminated Soil	29,194	27,123	56,318
Mixed/Hazardous Waste	6,863	6,863	13,727
Shared Miscellaneous Site Structures	0	4,631	4,631
Steam Generator Blowdown Treatment Facility	0	615	615
Subtotal	36,058	39,234	75,291

**SYSTEMS**

Auxiliary Steam - Insulated	27	19	47
Condensate Polish Filter Demin	28	0	28
Condensate Polish Filter Demin - Ins	83	0	83
Demineralized Makeup Water - RCA	37	19	56
Demineralized Makeup Water	18	6	24
Domestic/Makeup/Service Water	210	10	220
Domestic/Makeup/Service Water-Ins	4	1	5
Domestic/Makeup/Service Water-Ins-RCA	35	0	35
Domestic/Makeup/Service Water - RCA	304	71	375
Fire Protection	82	63	145
Fire Protection - Insulated	8	7	15
Fire Protection - Insulated - RCA	6	17	23
Fire Protection - RCA	76	193	269
Neutralization Basin Recirculation	21	0	21
Primary Water	670	639	1,310
Primary Water - Insulated	7	7	14
Service & Instrument Air	30	23	53
Service & Instrument Air - Ins	15	12	27
Service & Instrument Air - Ins - RCA	172	117	288
Service & Instrument Air - Ins	15	12	27

**TABLE 3.5 (continued)**  
**SUMMARY OF COSTS**  
**SHARED SYSTEMS and STRUCTURES**  
(thousands, 2015 dollars)

	UNIT 1	UNIT 2	TOTAL
<b>SYSTEMS (continued)</b>			
SGBTF Blowdown - Insulated	28	2,063	2,091
SGBTF Demin - Ins - RCA	0	136	136
SGBTF Demin - RCA	0	239	239
SGBTF HVAC	67	0	67
SGBTF Misc - RCA	16	0	16
SGBTF Miscellaneous - RCA	0	84	84
SGBTF Waste Management	12	185	197
SGBTF Waste Management - Insulated	115	158	272
Sodium Hypochlorite	0	54	54
Water Treatment - Insulated	46	0	46
Water Treatment	80	0	80
Subtotal	2,213	4,134	6,347
<b>MISCELLANEOUS COMPONENTS *</b>			
Clean Miscellaneous Components			27
Contaminated Miscellaneous Component			124
Subtotal			151
<b>TOTAL</b>			<b>81,789</b>

\* Includes Shared Refueling Equipment (20), Valves & Piping for Condensate Storage Tank Interconnection, Turbine Lube Oil Storage Tank, Waste Oil Storage Tank, Miscellaneous Small Bore Piping, Valves & Piping for Holdup Tanks Interconnection, Valves & Piping for Aerated Waste Storage Tank Interconnect, SGBTF Electrical (9), Tank, Valves, Piping - UHS Valves & Emergency Air, and Piping for Waste Management System Interconnects

SECTION 11

DECOMMISSIONING COST ANALYSIS  
FOR THE ST. LUCIE NUCLEAR PLANT UNITS 1 AND 2

Prepared by  
TLG Services, Inc.

**DECOMMISSIONING COST ANALYSIS**

**for the**

**ST. LUCIE NUCLEAR PLANT,  
UNITS 1 AND 2**



*prepared for*

**Florida Power & Light Company**

*prepared by*

**TLG Services, Inc.  
Bridgewater, Connecticut**

**November 2015**

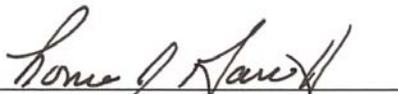
APPROVALS

Project Manager

  
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William A. Cloutier, Jr.

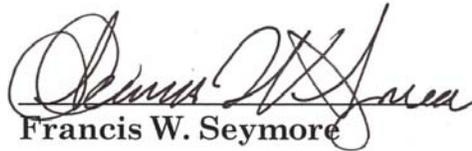
23 Nov 2015  
Date

Project Engineer

  
\_\_\_\_\_  
Thomas J. Garrett

11-23-15  
Date

Technical Manager

  
\_\_\_\_\_  
Francis W. Seymore

11/23/15  
Date

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**REVISION LOG**

<b>No.</b>	<b>Date</b>	<b>Item Revised</b>	<b>Reason for Revision</b>
0	11-23-2015		Original Issue

## **EXECUTIVE SUMMARY**

This report presents estimates of the cost to decommission the St. Lucie Nuclear Plant, Units 1 and 2 (St. Lucie) for the selected decommissioning scenarios following the scheduled cessation of plant operations. The estimates are designed to provide Florida Power & Light Company (FPL) with the information to assess its decommissioning liability, as it relates to St. Lucie.

The analysis relies upon site-specific, technical information from an evaluation prepared in 2010,<sup>[1]</sup> updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not an engineering evaluation, but estimates prepared in advance of the detailed planning required to carry out the decommissioning of the nuclear units. It may also not reflect the actual plan to decommission St. Lucie; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2010 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. No changes to the plant or site over the past five years, that would impact decommissioning, were identified.

The costs to decommission St. Lucie for the scenarios evaluated are tabulated at the end of this section. Costs are reported in 2015 dollars and include monies anticipated to be spent for radiological remediation and operating license termination, spent fuel management, and site restoration activities.

A complete discussion of the assumptions relied upon in this analysis is provided in Section 3, along with schedules of annual expenditures for each scenario. A sequence of significant project activities is provided in Section 4 with a timeline for each scenario. Detailed cost reports used to generate the summary tables contained within this document are provided in Appendices C, D and E.

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<sup>1</sup> “Decommissioning Cost Analysis for the St. Lucie Nuclear Plant, Units 1 and 2,” Document F02-1630-002, Rev. 0, TLG Services, Inc., December 2010

Consistent with the 2010 analysis, the current cost estimates assume that the shutdown of the nuclear units is a scheduled and pre-planned event (e.g., there is no delay in transitioning the plant and workforce from operations or in obtaining regulatory relief from operating requirements). The prompt decommissioning scenario assumes that the dismantling of Unit 1 is delayed so as to sequence decommissioning operations with the Unit 2 (since there is a seven year offset in unit shutdown dates).

The analysis recognizes that spent fuel will be stored at the site in the wet storage pools and/or in an independent spent fuel storage installation (ISFSI) until such time that it can be transferred to the U.S. Department of Energy (DOE). Consequently, the estimates also include those costs to manage and subsequently decommission these interim storage facilities.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the operating licenses for the nuclear units can be terminated. The estimates also include the dismantling of site structures and non-essential facilities and the limited restoration of the site.

### Alternatives and Regulations

The Nuclear Regulatory Commission (NRC) provided general decommissioning requirements in a rule adopted on June 27, 1988.<sup>[2]</sup> In this rule, the NRC set forth technical and financial criteria for decommissioning licensed nuclear facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

DECON is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."<sup>[3]</sup>

SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred

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<sup>2</sup> U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72 "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

<sup>3</sup> Ibid. Page FR24022, Column 3

decontamination) to levels that permit release for unrestricted use."<sup>[4]</sup> Decommissioning is required to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety.

ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactive material decays to a level permitting unrestricted release of the property."<sup>[5]</sup> As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety..

The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations; however, rulemaking has been deferred pending completion of additional research studies (e.g., on engineering barriers).

In 1996, the NRC published revisions to its general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process.<sup>[6]</sup> The amendments allow for greater public participation and better define the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000 (as revised in October 2013), further described the methods and procedures that are acceptable to the NRC staff for implementing the requirements of the 1996 revised rule that related to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued in February 2005.<sup>[7]</sup>

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<sup>4</sup> Ibid.

<sup>5</sup> Ibid. Page FR24023, Column 2

<sup>6</sup> U.S. Code of Federal Regulations, Title 10, Parts 2, 50, and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, Federal Register Volume 61, (p 39278 et seq.), July 29, 1996

<sup>7</sup> "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, Nuclear Regulatory Commission, February 2005

## Decommissioning Scenarios

Two decommissioning scenarios were evaluated for St. Lucie. The scenarios selected are representative of alternatives currently available to the owner and are defined as follows:

1. The first scenario assumes that decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes. With an almost seven year off-set in shutdown dates, Unit 1 is placed into an abbreviated period of safe-storage after operations cease in March 2036. The unit remains in storage until Unit 2 completes its operations in April 2043. Preparations for the decommissioning of Unit 1 begin shortly after decommissioning operations at Unit 2 are underway and follow a similar dismantling sequence. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI so as to facilitate decontamination and dismantling activities within the fuel handling buildings. Spent fuel storage operations continue at the site until the transfer of the fuel to the DOE is complete, assumed to be in the year 2073.
2. In the second scenario, both units are placed into safe-storage shortly after the permanent cessation of operations and defueling. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI to minimize caretaking costs. Decommissioning is deferred beyond the fuel storage period to the maximum extent possible; termination of the licenses would conclude within the required 60-year period. As with the DECON scenario, decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes.

## Methodology

The methodology used to develop the estimates follows the basic approach originally presented in the cost estimating guidelines<sup>[8]</sup> developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit cost factor method for estimating decommissioning activity costs. The unit cost factors used in this analysis incorporate site-specific costs and the latest available information about worker productivity in decommissioning.

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<sup>8</sup> T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

An activity duration critical path is used to determine the total decommissioning program schedule. This is required for calculating the carrying costs, which include program management, administration, field engineering, equipment rental, quality assurance and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

The estimates reflect lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, San Onofre and Vermont Yankee nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

### Contingency

Consistent with cost estimating practice, contingencies are applied to the decontamination and dismantling costs developed as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."<sup>9</sup> The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the nuclear units.

Contingency funds are expected to be fully expended throughout the program. As such, inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

### Low-Level Radioactive Waste Management

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is generally classified as low-level radioactive waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Disposal Act" in

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<sup>9</sup> Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239

1980,<sup>[10]</sup> and its Amendments of 1985,<sup>[11]</sup> the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to FPL. The majority of the low-level radioactive waste designated for direct disposal (Class A<sup>[12]</sup>) can be sent to EnergySolutions' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon FPL's Life of Plant Agreement with EnergySolutions. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste was assumed to be shipped to the WCS facility and disposal costs for the waste were based upon published rates for non-Compact generators.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis only, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in the same canisters used for spent fuel and either stored on site or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

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<sup>10</sup> "Low-Level Radioactive Waste Policy Act of 1980," Public Law 96-573, 1980

<sup>11</sup> "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, 1986

<sup>12</sup> Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55

A significant portion of the metallic waste generated during decommissioning may potentially be contaminated by radioactive materials. Rather than designating this large volume for controlled disposal, this analysis assumes that the material is sent to a licensed facility for characterization and processing. Processing is routinely used to reduce the volume, for example, by component disassembly, sorting, compaction and metal melt. The estimates reflect the savings from waste recovery/volume reduction.

### High-Level Radioactive Waste Management

Congress passed the “Nuclear Waste Policy Act” (NWPA) in 1982, assigning the federal government’s long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. It was to begin accepting spent fuel by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, even with the License Application for a geologic repository submitted by the DOE to the NRC in 2008. The current administration has cut the budget for the repository program while promising to “conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle ... and make recommendations for a new plan.”<sup>[13]</sup>

Towards this goal, the administration appointed a Blue Ribbon Commission on America’s Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission’s charter includes a requirement that it consider “[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed.”<sup>[14]</sup>

On January 26, 2012, the Blue Ribbon Commission issued its “Report to the Secretary of Energy” containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- “[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities”<sup>[15]</sup>

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<sup>13</sup> Charter of the Blue Ribbon Commission on America’s Nuclear Future, “Objectives and Scope of Activities,” <http://www.brc.gov/index.php?q=page/charter>

<sup>14</sup> Ibid.

<sup>15</sup> “Blue Ribbon Commission on America’s Nuclear Future, Report to the Secretary of Energy,” [http://www.brc.gov/sites/default/files/documents/brc\\_finalreport\\_jan2012.pdf](http://www.brc.gov/sites/default/files/documents/brc_finalreport_jan2012.pdf), p. 32, January 2012

- “[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste.”<sup>[16]</sup>

In January 2013, the DOE issued the “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” in response to the recommendations made by the Blue Ribbon Commission and as “a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel...”<sup>[17]</sup>

“With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”<sup>[18]</sup>

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)<sup>[19]</sup> ordering NRC to comply with federal law and resume its review of DOE’s Yucca Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE’s environmental impact statement and an adjudicatory hearing on the contentions

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<sup>16</sup> *Ibid.*, p.27

<sup>17</sup> “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” U.S. DOE, January 11, 2013

<sup>18</sup> *Ibid.*, p.2

<sup>19</sup> U.S. Court of Appeals for the District Of Columbia Circuit, In Re: Aiken County, et al, Aug. 2013, [http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/\\$file/11-1271-1451347.pdf](http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/$file/11-1271-1451347.pdf)

filed by interested parties must be completed before a licensing decision can be made.

A federal appeals court has ruled that DOE's obligation to take possession of spent nuclear fuel is unconditional and cannot be excused either by the absence of a repository or by a claim of unavoidable delay. FPL filed a lawsuit in 2004 claiming damages for DOE's failure to perform as originally prescribed in the standard disposal contract. On March 31, 2009, FPL executed a Settlement Agreement with the DOE and the Department of Justice (DoJ). In the Agreement, FPL settled the lawsuit in exchange for payments. The payments are intended to cover those costs incurred for managing and storing the spent fuel that it would not have incurred but for DOE's delay in performance.

While the DOE is responsible for the costs incurred until it fulfills its obligation, certain assumptions are needed to assess the financial impact on the identified decommissioning cost scenarios. The assumptions and methodology employed to quantify the expected level of compensation are outlined in Section 3.8.

Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program assumes that spent fuel allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.<sup>[20]</sup> FPL's current spent fuel management plan for St. Lucie spent fuel is based in general upon the first assemblies being removed from the site in 2032. With an estimated, maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, completion of the removal of fuel from the site is conservatively projected to be in the year 2073. Consequently, costs are included within the estimates for the long-term caretaking of the spent fuel at the St. Lucie site until the year 2073. Different DOE acceptance schedules may result in different completion dates.

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<sup>20</sup> In 2008, the DOE issued a report to Congress in which it concluded that it did not have authority, under present law, to accept spent nuclear fuel for interim storage from decommissioned commercial nuclear power reactor sites. However, the Blue Ribbon Commission, in its final report, noted that: "[A]ccepting spent fuel according to the OFF [Oldest Fuel First] priority ranking instead of giving priority to shutdown reactor sites could greatly reduce the cost savings that could be achieved through consolidated storage if priority could be given to accepting spent fuel from shutdown reactor sites before accepting fuel from still-operating plants. .... The magnitude of the cost savings that could be achieved by giving priority to shutdown sites appears to be large enough (i.e., in the billions of dollars) to warrant DOE exercising its right under the Standard Contract to move this fuel first." For planning purposes only, this estimate does not assume that St. Lucie, as a permanently shutdown plant, will receive priority; the fuel removal schedule assumed in this estimate is based upon DOE acceptance of fuel according to the "Oldest Fuel First" priority ranking. The plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance.

NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE.<sup>[21]</sup> Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel handling buildings' spent fuel storage pools, as well as at the on-site ISFSI.

FPL's position is that the DOE has a contractual obligation to accept St. Lucie's fuel far earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the plant's life if, contrary to its contractual obligation, the DOE has not performed earlier.

### Site Restoration

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities can substantially damage power block structures, potentially weakening the footings and structural supports. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized is more efficient and less costly than if the process is deferred.

Consequently, this study assumes that the structures addressed by this analysis are removed to a nominal depth of three feet below grade. The site is then graded and stabilized.

### Summary

The estimates to decommission St. Lucie assume the removal of all contaminated and activated plant components and structural materials such that the owner may then have unrestricted use of the site with no further requirements for an operating license. Low-level radioactive waste, other than GTCC waste, is sent to a commercial processor for treatment/conditioning or to a controlled disposal facility.

Decommissioning is accomplished within the 60-year period required by current NRC regulations. In the interim, the spent fuel remains in storage at the site until such time that the transfer to a DOE facility is complete.

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<sup>21</sup> U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses"

The alternatives evaluated in this analysis are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendices C and D. The major cost components are also identified in the cost summary provided at the end of this section.

The cost elements in the estimates for the DECON and SAFSTOR alternatives are assigned to one of three subcategories: NRC License Termination (radiological remediation), Spent Fuel Management, and Site Restoration. The subcategory “NRC License Termination” is used to accumulate costs that are consistent with “decommissioning” as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the reactors’ operating licenses, recognizing that there may be some additional cost impact from spent fuel management. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). Section 3.5.1 provides the basis for the ISFSI decommissioning cost, delineated in Appendix E.

The “Spent Fuel Management” subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the DOE and/or ISFSI for interim storage, as well as the transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pools and the management of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any cost related to the final disposal of the spent fuel. Under the terms of the settlement agreement with the DOE, there are activities and costs identified in the decommissioning cost study that are expected to be eligible for reimbursement (depending upon the timing of the activities). The activities are identified in Section 3.8 and the costs in Tables 3.7 through 3.9.

“Site Restoration” is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Consequently, this study assumes that the site structures addressed by this analysis are removed to a depth of three feet and backfilled to conform to local grade.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, an owner may decide to remove non-

contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of those costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

As noted within this document, the estimates were developed and costs are presented in 2015 dollars. As such, the estimates do not reflect the escalation of costs (due to inflationary and market forces) over the remaining operating life of the plant or during the decommissioning period.

**DECON COST SUMMARY**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,664	16,384	28,048
Removal	102,056	113,647	215,703
Packaging	28,620	30,628	59,248
Transportation	22,428	24,039	46,466
Waste Disposal	86,268	91,914	178,181
Off-site Waste Processing	15,913	17,213	33,126
Program Management <sup>[1]</sup>	294,290	268,532	562,822
Site Security	89,129	92,343	181,472
Spent Fuel Pool Isolation	12,750	8,500	21,250
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	160,006	120,959	280,964
Insurance and Regulatory Fees	26,423	20,824	47,247
Energy	25,948	20,880	46,828
Characterization and Licensing Surveys	19,293	23,852	43,144
Property Taxes	8,603	1,890	10,493
Miscellaneous Equipment	9,098	7,685	16,783
Fixed Overhead	12,984	6,403	19,387
INPO, NEI Fees	6,509	3,678	10,187
Florida LLRW Inspection Fee	2,669	2,462	5,130
<b>Total <sup>[3]</sup></b>	<b>934,649</b>	<b>871,831</b>	<b>1,806,479</b>

Cost Element	Unit 1	Unit 2	Total
License Termination	589,149	619,088	1,208,237
Spent Fuel Management <sup>[4]</sup>	296,190	190,515	486,705
Site Restoration	49,309	62,228	111,537
<b>Total <sup>[3]</sup></b>	<b>934,649</b>	<b>871,831</b>	<b>1,806,479</b>

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

**SAFSTOR COST SUMMARY**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Unit 1	Unit 2	Total
Decontamination	11,136	11,716	22,851
Removal	101,377	112,868	214,245
Packaging	21,192	21,451	42,642
Transportation	19,813	19,520	39,333
Waste Disposal	79,848	79,327	159,175
Off-site Waste Processing	15,101	17,366	32,467
Program Management <sup>[1]</sup>	349,268	342,054	691,321
Site Security	134,352	118,925	253,276
Spent Fuel Pool Isolation	12,750	8,500	21,250
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	155,155	115,974	271,129
Insurance and Regulatory Fees	49,894	43,942	93,837
Energy	40,675	39,320	79,995
Characterization and Licensing Surveys	23,325	19,763	43,088
Property Taxes	9,537	2,823	12,359
Miscellaneous Equipment	16,898	19,434	36,331
Fixed Overhead	20,459	18,338	38,797
INPO, NEI Fees	5,941	5,508	11,449
Florida LLRW Inspection Fee	2,701	2,491	5,192
<b>Total <sup>[3]</sup></b>	<b>1,069,419</b>	<b>999,319</b>	<b>2,068,739</b>

Cost Element	Unit 1	Unit 2	Total
License Termination	740,055	717,305	1,457,360
Spent Fuel Management <sup>[4]</sup>	278,217	219,993	498,209
Site Restoration	51,148	62,022	113,170
<b>Total <sup>[3]</sup></b>	<b>1,069,419</b>	<b>999,319</b>	<b>2,068,739</b>

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

## **1. INTRODUCTION**

This report presents estimates of the cost to decommission the St. Lucie Nuclear Plant, Units 1 and 2, (St. Lucie), assuming a 60-year operating life for the selected decommissioning scenarios following a scheduled cessation of plant operations. The estimates are designed to provide Florida Power & Light Company (FPL) with the information to assess its current decommissioning liability, as it relates to St. Lucie.

The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2010,<sup>[1]\*</sup> updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not an engineering evaluation, but estimates prepared in advance of the detailed planning required to carry out the decommissioning of the nuclear units. It may also not reflect the actual plan to decommission St. Lucie; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2010 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. No changes to the plant or site over the past five years, that would impact decommissioning, were identified.

### **1.1 OBJECTIVES OF STUDY**

The objectives of this study are to prepare comprehensive estimates of the costs to decommission St. Lucie, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities.

Consistent with NRC guidance indicating that decommissioning funding should be based on the current license life of the plant, the cessation of operations is assumed to be on March 1, 2036 and April 6, 2043 for Units 1 and 2, respectively.

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\* References provided in Section 7 of the document

## **1.2 SITE DESCRIPTION**

The St. Lucie site is located approximately halfway between the cities of Fort Pierce and Stuart on the east coast of Florida. Units 1 and 2 are essentially identical pressurized water reactors with supporting facilities. FPL is the primary owner and operator of the plant. The nuclear units were designed and constructed by Ebasco Services, Inc.

The nuclear steam supply systems were designed by Combustion Engineering. The reactor coolant systems consist of two similar heat transfer loops connected in parallel to the reactor pressure vessel. Each loop contains two reactor coolant pumps, one steam generator, and associated piping and valves. In addition, the systems include a pressurizer, a pressurizer relief tank, interconnecting piping, and instrumentation necessary for operational control. All the system equipment, except for the digital pressure indicator, three wide range pressure transmitters, and the containment isolation and process actuated valves located in the lines connected to the pressurizer relief tank, are located in the containment buildings.

The containments are a dual containment design comprised of a steel containment vessel surrounded by an annular space and enclosed by reinforced concrete shield buildings. The vessel is cylindrical in shape with a hemispherical dome and ellipsoidal bottom.

Heat produced in the reactors is converted to electrical energy by the steam and power conversion system. The function of the turbine generators, which serve no safety function, is to receive steam from steam generators, economically convert a portion of the thermal energy contained in the steam to electrical energy, and provide extraction steam for five stages of feedwater heating. Steam is directed from the high pressure turbine element to four combination moisture-separator/reheater assemblies before entering the low pressure turbines. The exhaust steam from the two low pressure turbines is condensed in the condenser. With the completion of the extended power uprate activities (described below), Units 1 and 2 have a design electrical rating 1,062 megawatt-electric (MWe) gross and 1,074 MW gross, respectively.

Heat rejected in the main condensers is removed by the circulating water systems, which condenses the steam exhaust from the turbine. Cooling water for the condenser is supplied by the Atlantic Ocean.

Modifications to the plant during the 2010, 2011 and 2012 refueling outages increased the power output for each unit. The Extended Power Uprate (EPU) resulted in a 12-percent increase. The original licensed core rated thermal

power level was 2,560 megawatts-thermal (MWt). This was increased to 2,700 MWt after a 5.5-percent stretch power uprate in 1981. The current licensed thermal power rating, after the EPU modifications, is 3,020 MWt. The impact of the EPU (e.g., from increased neutron fluence), although not significant in decommissioning, is considered in this analysis.

### **1.3 REGULATORY GUIDANCE**

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.<sup>[2]</sup> This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors,"<sup>[3]</sup> which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the plant's systems, structures and facilities are removed or decontaminated to levels that permit the site to be released for unrestricted use shortly after the cessation of plant operations, while the SAFSTOR and ENTOMB alternatives defer the process.

The rule also placed limits on the time allowed to complete the decommissioning process. For all alternatives, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. At the conclusion of a 60-year dormancy period (or longer if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. However, with rulemaking permitting the controlled release of a site,<sup>[4]</sup> the NRC did re-evaluated the

alternative. The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most reactors. The staff also found that additional rulemaking would be needed before this option could be treated as a generic alternative.

The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments.<sup>[5]</sup> However, the NRC's staff has subsequently recommended that rulemaking be deferred, based upon several factors (e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities), at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants.<sup>[6]</sup> When the decommissioning regulations were adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after the decision to cease operations. Certification will also be required once the fuel is permanently removed from the reactor vessel. Submittal of these notices, along with related changes to Technical Specifications, entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee is required to submit an application to the NRC to terminate the license, which will include a license termination plan (LTP).

In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.<sup>[7]</sup> The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. The additional details, including a decommissioning estimate for the Independent Spent Fuel Storage Installation (ISFSI), are included in this study.

### 1.3.1 High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act" (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. It was to begin accepting spent fuel by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, even with the License Application for a geologic repository submitted by the DOE to the NRC in 2008. The current administration has cut the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle ... and make recommendations for a new plan."

Towards this goal, the administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter includes a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."<sup>[8]</sup>

On January 26, 2012, the Blue Ribbon Commission issued its "Report to the Secretary of Energy" containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- “[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities”
- “[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste.”<sup>[9]</sup>

In January 2013, the DOE issued the “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” in response to the recommendations made by the Blue Ribbon Commission and as “a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel...” <sup>[10]</sup>

“With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)<sup>[11]</sup> ordering NRC to comply with federal law and resume its review of DOE’s Yucca Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE’s environmental impact statement and an

adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

A federal appeals court has ruled that DOE's obligation to take possession of spent nuclear fuel is unconditional and cannot be excused either by the absence of a repository or by a claim of unavoidable delay. FPL filed a lawsuit in 2004 claiming damages for DOE's failure to perform as originally prescribed in the standard disposal contract. On March 31, 2009, FPL executed a Settlement Agreement with the DOE and the Department of Justice (DoJ). In the Agreement, FPL settled the lawsuit in exchange for payments. The payments are intended to cover those costs incurred for managing and storing the spent fuel that it would not have incurred but for DOE's delay in performance.

While the DOE is responsible for the costs incurred until it fulfills its obligation, certain assumptions are needed to assess the financial impact on the identified decommissioning cost scenarios. The assumptions and methodology employed to quantify the expected level of compensation are outlined in Section 3.8.

Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program assumes that spent fuel allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.<sup>[12]</sup> FPL's current spent fuel management plan for St. Lucie spent fuel is based in general upon the first assemblies being removed from the site in 2032. With an estimated, maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, completion of the removal of fuel from the site is conservatively projected to be in the year 2073. Consequently, costs are included within the estimates for the long-term caretaking of the spent fuel at the St. Lucie site until the year 2073. Different DOE acceptance schedules may result in different completion dates.

NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE.<sup>[13]</sup> Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel handling buildings' spent fuel storage pools, as well as at the on-site ISFSI.

FPL's position is that the DOE has a contractual obligation to accept St. Lucie's fuel far earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be

interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the plant's life if, contrary to its contractual obligation, the DOE has not performed earlier.

### 1.3.2 Low-Level Radioactive Waste Management

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,<sup>[14]</sup> and its Amendments of 1985,<sup>[15]</sup> the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to FPL. The majority of the low-level radioactive waste designated for direct disposal (Class A<sup>[16]</sup>) can be sent to EnergySolutions' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon FPL's Life of Plant Agreement with EnergySolutions. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste was assumed to be shipped to the WCS facility and disposal costs for the waste were based upon published rates for non-Compact generators.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive

Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis only, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in the same canisters used for spent fuel and either stored on site or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the metallic waste generated during decommissioning may potentially be contaminated by radioactive materials. Rather than designating this large volume for controlled disposal, this analysis assumes that the material is sent to a licensed facility for characterization and processing. Processing is routinely used to reduce the volume, for example, by component disassembly, sorting, compaction and metal melt. The estimates reflect the savings from waste recovery/volume reduction.

### 1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination,"<sup>[17]</sup> amending 10 CFR Part 20. This subpart provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The decommissioning estimates assume that the St. Lucie site will be remediated to a residual level consistent with the NRC-prescribed level. It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).<sup>[18]</sup>

An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water.<sup>[19]</sup>

On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU)<sup>[20]</sup> provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

## **2. DECOMMISSIONING ALTERNATIVES**

Detailed cost estimates were developed to decommission St. Lucie based upon the approved decommissioning alternatives: DECON and SAFSTOR. Although the alternatives differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

Two decommissioning scenarios were evaluated for St. Lucie. The scenarios selected are representative of alternatives currently available to the owner and are defined as follows:

1. The first scenario assumes that decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes. With a seven year off-set in shutdown dates, Unit 1 is placed into an abbreviated period of safe-storage after operations cease in March 2036. The unit remains in storage until Unit 2 completes its operations in April 2043. Preparations for the decommissioning of Unit 1 begin shortly after decommissioning operations at Unit 2 are underway and follow a similar dismantling sequence. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI so as to facilitate decontamination and dismantling activities within the fuel handling buildings. Spent fuel storage operations continue at the site until the transfer of the fuel to the DOE is complete, assumed to be in the year 2073.
2. In the second scenario, both units are placed into safe-storage shortly after the permanent cessation of operations and defueling. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI to minimize caretaking costs. Decommissioning is deferred beyond the fuel storage period to the maximum extent possible; termination of the licenses would conclude within the required 60-year period. As with the DECON scenario, decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work, i.e., engineering and planning at the time of decommissioning.

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective

date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations (i.e., power production) to facility de-activation and closure. During the first phase, notification is to be provided to the NRC certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee is then prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for St. Lucie are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in the projected expenditures.

## **2.1 DECON**

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to an off-site disposal facility.

### **2.1.1 Period 1 - Preparations**

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. Through implementation of a staffing transition plan, the organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications applicable to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

#### **Engineering and Planning**

The PSDAR, required prior to or within two years of permanent cessations of operations, provides a description of the licensee's planned decommissioning activities, a timetable, a site-specific decommissioning

cost estimate, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local hearing to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure (10 CFR §50.59 establishes the conditions under which licensees may make changes to the facility or procedures and conduct test or experiments, i.e., without prior NRC approval). Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, steam generators, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

- foreclose release of the site for possible unrestricted use,
- significantly increase decommissioning costs,
- cause any significant environmental impact, or
- violate the terms of the licensee's existing license.

Existing operational technical specifications are reviewed and modified to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities is also considered. Typically, a licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than that bounded by previously evaluated environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, and

work packages and procedures, would be assembled to support the proposed decontamination and dismantling activities.

### Site Preparations

Following final plant shutdown, and in preparation for actual decommissioning activities, the following activities are initiated:

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the reactor vessel and its internals), internal piping, and primary shield cores.
- Isolation of the spent fuel storage pools and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. The pools will remain operational for approximately five and one half years following the cessation of operations. During this time period, it is assumed that the spent fuel residing in the pools that cannot be directly transferred to the DOE will be moved to the ISFSI for interim storage.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.

The DECON cost model for Unit 1 uses the nomenclature of the SAFSTOR alternative to accommodate the seven year offset in unit shutdown dates and the inclusion of a delay in the start of Unit 1 decommissioning. As such, Period 2, for Unit 1, is an abbreviated period of storage, awaiting the cessation of operations at Unit 2. During this period the fuel is offloaded from the Unit 1 storage pool to either the DOE or the ISFSI. Essential systems (to future decommissioning operations) are maintained and operational waste inventories processed during this period. Period 2 is followed by preparations to reactivate the unit for decontamination and dismantling, referred to as Period 3 for purposes of the cost model. The activities in Periods 4 and 5 for Unit 1 are identical to those delineated in Period 2 and Period 3 below with the exception of any defueling activities that have already been performed at Unit 1.

### 2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful release of the site from the 10 CFR §50 operating license(s), exclusive of the ISFSI. Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. For example, this will include a centralized processing area to facilitate equipment removal and component preparations for off-site disposal.
- Reconfiguration and modification of site structures and facilities as needed to support decommissioning operations. This will include the upgrading of roads (on- and off-site), as required, to facilitate hauling and transport. Modifications may be required to the containment structure to facilitate access of large/heavy equipment. Modifications will also be required to the refueling area of the building to support the segmentation of the reactor vessel internals and component extraction.
- Transfer of the spent fuel from the storage pools to the DOE and/or ISFSI pad.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.
- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from reactor vessel head. Segmentation of the vessel closure head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks, i.e., by weight and activity. The operations are conducted under water using remotely operated tooling and contamination controls.

- Disassembly and segmentation of the remaining reactor internals, including the core shroud and lower core support assembly. Some material is expected to exceed Class C disposal requirements. As such, the segments will be packaged in modified fuel storage canisters for geologic disposal.
- Segmentation of the reactor vessel. A shielded platform is installed for segmentation as cutting operations are performed in-air using remotely operated equipment within a contamination control envelope. The water level is maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the associated cubicles necessary for access and component extraction are removed.
- Removal of the steam generators and pressurizer for material recovery and controlled disposal. The generators will be moved to an on-site processing center, the steam domes removed and the internal components segregated for recycling. The lower shell and tube bundle will be packaged for direct disposal. These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized, e.g., with grout. Steel shielding will be added, as necessary, to those external areas of the package to meet transportation limits and regulations.

At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local hearing. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).
- Removal of the steel liners from refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/ contaminated concrete.
- Surveys of the decontaminated areas of the containment structure.
- Remediation and removal of the contaminated equipment and material from the auxiliary and fuel buildings, and any other contaminated facility. Radiation and contamination controls will be utilized until residual levels indicate that the structures and equipment can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these buildings. This activity facilitates surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).”<sup>[21]</sup> This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a

determination on the requested change to the operating license (that would release the property, exclusive of the ISFSI, for unrestricted use).

The NRC will amend the operating license(s) if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the property (exclusive of the ISFSI) is suitable for release.

### 2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities can begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled, safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures including the reactor, auxiliary, radwaste warehouse and fuel buildings. Under certain circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the plant.

It is not currently anticipated that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized on site is more efficient than if the process is deferred.

This cost study presumes that non-essential structures and site facilities are dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are removed to a nominal depth of three feet below grade. The site is then graded and stabilized.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. The processed material is used on site to backfill foundation voids or

shipped off-site for conventional disposal as construction debris and/or recycled.

#### 2.1.4 ISFSI Operations and Decommissioning

For purposes only of this estimate, transfer of spent fuel to a DOE repository or interim facility is assumed to be exclusively from the ISFSI once the fuel pools have been emptied and the fuel handling buildings released for decommissioning. The ISFSI will continue to operate under a general license (10 CFR §50) following the amendment of the operating license(s) to release the adjacent (power block) property.

Assuming the DOE starts accepting fuel from the St. Lucie in 2032, transfer of spent fuel from the ISFSI is anticipated to begin in 2049, and continue through the year 2073. This assumption is made for purposes of this estimate, although it is acknowledged that the plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission will terminate the Part 50 license if it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license for the ISFSI.

## **2.2 SAFSTOR**

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems that are not required to support the spent fuel pools or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative, although shorter time period is expected for these activities due to the more limited work scope. Site preparations are also

similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

### 2.2.1 Period 1 - Preparations

Preparations for long-term storage include the planning for permanent defueling of the reactor, revision of technical specifications appropriate to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

The process of placing the plant in safe-storage includes, but is not limited to, the following activities:

- Isolation of the spent fuel storage services and fuel handling systems so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are scheduled around the fuel handling systems to the greatest extent possible.
- Transferring of the spent fuel from the storage pools to the DOE or to the ISFSI, following the minimum required cooling period in the spent fuel pools.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.
- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessel, with the internals left in place and the vessel head secured.
- Draining and de-energizing non-essential, contaminated systems with decontamination as required for future maintenance and inspection.
- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey of the plant, posting warning signs where appropriate.

- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.
- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

### 2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented and/or detected and controlled. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to prevent unauthorized entry and to protect the public from the consequences of its own actions. The security fence, sensors, alarms, and other surveillance equipment are maintained throughout the dormancy period. Fire and radiation alarms are also functional.

Consistent with the DECON scenario, the spent fuel storage pools are emptied within five and one half years of the cessation of operations. It is assumed that the transfer of the spent fuel from the site to the DOE begins in 2032. The transfer continues throughout the dormancy period until completed in 2073. This assumption is made for purposes of this estimate, although it is acknowledged that the plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance. If the assumption of transfer of fuel from the

ISFSI to DOE is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers and to dispose of existing containers. Once emptied, the ISFSI is secured for storage and decommissioned along with the power block structures in Period 4.

After a period of storage (such that license termination is accomplished within 60 years of final shutdown), it is required that the licensee submit an application to terminate the license, along with a LTP (described in Section 2.1.2), thereby initiating the third phase.

### 2.2.3 Periods 3 and 4 - Delayed Decommissioning

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning and the assembly of activity specifications and detailed work procedures are also initiated at this time.

Much of the work in developing a termination plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase and the follow-on decontamination and dismantling processes are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and this deferred scenario is the absence, in the latter, of any constraint on the dismantling process due to the operation of the spent fuel pools in the DECON option.

Variation in the length of the dormancy period are expected to have some effect upon the quantities of radioactive wastes generated from system and structure removal operations. Given the levels of radioactivity and spectrum of radionuclides expected from sixty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone. However, due to the lower activity levels, a greater percentage of the waste volume can be designated for off-site processing and recovery.

The delay in decommissioning also yields lower working area radiation levels. As such, the estimate for this delayed scenario incorporates

reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

Although the initial radiation levels due to  $^{60}\text{Co}$  will substantially decrease during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as  $^{94}\text{Nb}$ ,  $^{59}\text{Ni}$ , and  $^{63}\text{Ni}$ . Therefore, the dismantling procedures described for the DECON alternative would still be employed during this scenario. Portions of the biological shield wall will still be radioactive due to the presence of activated trace elements with long half-lives ( $^{152}\text{Eu}$  and  $^{154}\text{Eu}$ ). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

#### 2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities begin. Dismantling, as a continuation of the decommissioning process, is a cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost is consistent with that described for DECON, presuming the removal of structures and site facilities to a nominal depth of three feet below grade and the limited restoration of the site.

### **3. COST ESTIMATE**

The cost estimates prepared for decommissioning St. Lucie consider the unique features of the site, including the nuclear steam supply system, electric power generating systems, structures and supporting facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

#### **3.1 BASIS OF ESTIMATE**

The current estimates were developed using the site-specific, technical information relied upon in the decommissioning analysis prepared in 2010. This information was reviewed for the current analysis and updated as deemed appropriate. The site-specific considerations and assumptions used in the previous evaluation were also revisited. Modifications were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

#### **3.2 METHODOLOGY**

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"<sup>[22]</sup> and the DOE "Decommissioning Handbook."<sup>[23]</sup> These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal (\$/cubic yard), steel removal (\$/ton), and cutting costs (\$/inch) are developed using local labor rates. The activity-dependent costs are estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures rely upon information available in the industry publication, "Building Construction Cost Data," published by R.S. Means.<sup>[24]</sup>

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

This estimates reflect lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, San Onofre and Vermont Yankee nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

### Work Difficulty Factors

TLG has historically applied work difficulty adjustment factors (WDFs) to account for the inefficiencies in working in a power plant environment. WDFs are assigned to each unique set of unit factors, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

- Access Factor 10% to 20%
- Respiratory Protection Factor 10% to 50%
- Radiation/ALARA Factor 10% to 37%
- Protective Clothing Factor 10% to 30%
- Work Break Factor 8.33%

The factors and their associated range of values were developed in conjunction with the AIF/NESP-036 study. The application of the factors is discussed in more detail in that publication.

### Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiological controlled areas. The resulting man-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities is based upon productivity information available from the "Building Construction Cost Data" publication. In the DECON alternative, dismantling of the fuel handling buildings' systems and decontamination of the spent fuel pools is also dependent upon the timetable for the transfer of the spent fuel assemblies from the pools to the DOE and/or ISFSI.

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field engineering, equipment rental, and support services such as quality control and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

### **3.3 IMPACT OF DECOMMISSIONING MULTIPLE REACTOR UNITS**

In estimating the near simultaneous decommissioning of two co-located reactor units there can be opportunities to achieve economies of scale, by sharing costs between units, and coordinating the sequence of work activities. There will also be schedule constraints, particularly where there are requirements for specialty equipment and staff, or practical limitations on when final status surveys can take place. For purposes of the estimates, Units 1 and 2 are assumed to be essentially identical. Common facilities have been assigned to Unit 2. A summary of the principal impacts are listed below.

- The sequence of work (DECON) generally follows the principal that the work is done at Unit 2 first, followed by similar work at Unit 1. This permits the experience gained at Unit 2 to be applied by the workforce at the second unit. It should be noted however, that the estimates do not consider productivity improvements at the second unit, since there is little documented experience with decommissioning two units simultaneously. The work associated with developing activity specifications and procedures can, however, be considered essentially identical between the two units, therefore the second unit costs are assumed to be a fraction of the first unit (e.g., ~ 43% in DECON).
- Segmenting the reactor vessel and internals will require the use of special equipment. The decommissioning project will be scheduled such that Unit 1's reactor internals and vessel are segmented after the activities at Unit 2 have been completed, permitting the sharing of the cutting equipment.
- Some program management and support costs, particularly costs associated with the more senior positions, can be avoided with two reactors undergoing decommissioning simultaneously. As a result, the estimates are based on a "lead" unit that includes these senior positions, and a "second" unit that excludes these positions. The designation as lead is based on the unit undertaking the most complex tasks (for instance vessel segmentation) or performing tasks for the first time.
- The final radiological survey schedule is also affected by a two-unit decommissioning schedule. It would be considered impractical to try to

complete the final status survey of Unit 2, while Unit 1 still has ongoing radiological remediation work and waste handling in process.

- The final demolition of buildings at Units 1 and 2 are considered to take place concurrently.
- The first unit to enter decommissioning incurs the majority of site characterization costs.
- Shared systems and structures are generally assigned to Unit 2.
- Plant costs such as emergency response fees, regulatory agency fees, corporate overhead, and insurance are generally allocated on an equal basis between the two units.
- Dormancy costs (to maintain the units in safe-storage) in the SAFSTOR scenario are allocated on an equal basis between the two units.

### **3.4 FINANCIAL COMPONENTS OF THE COST MODEL**

TLG's proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination, spent fuel management and site restoration.

#### **3.4.1 Contingency**

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook"<sup>[25]</sup> as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and

maximum efficiency; therefore, consistent with industry practice, contingency is included. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for a contingency percentage in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the plant.

Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

- Decontamination 50%
- Contaminated Component Removal 25%
- Contaminated Component Packaging 10%
- Contaminated Component Transport 15%
- Low-Level Radioactive Waste Disposal 25%
  
- Low-Level Radioactive Waste Processing 15%
- Reactor Segmentation 75%
- Nuclear Steam Supply System Component Removal 25%
- Reactor Waste Packaging 25%
- Reactor Waste Transport 25%
  
- Reactor Vessel Component Disposal 50%
- GTCC Disposal 15%
- Non-Radioactive Component Removal 15%
- Heavy Equipment and Tooling 15%
- Supplies 25%
  
- Engineering 15%
- Energy 15%
- Construction 15%
- Insurance, Taxes and Fees 10%
- Staffing 15%

- Radiological Characterization and Termination Surveys 30%
- Operations and Maintenance Expenses 15%
- ISFSI Decommissioning 25%

The contingency values are applied to the appropriate components of the estimates on a line item basis. A composite value is then reported at the end of each detailed estimate (as provided in Appendix C and D).

### 3.4.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term “financial risk.” Included within the category of financial risk are:

- Transition activities and costs: ancillary expenses associated with reducing the size of the labor force (50% to 80%) shortly after the cessation of plant operations, added cost for worker separation packages throughout the decommissioning program, national or company-mandated retraining, and retention incentives for key personnel.
- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.
- Regulatory changes, for example, affecting worker health and safety, site release criteria, waste transportation, and disposal.
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition, or in the timetable for such, or the start and rate of acceptance of spent fuel by the DOE).

- Pricing changes for basic inputs such as labor, energy, materials, and waste disposal.

This cost study does not add any additional costs to the estimate for financial risk, since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk are revisited periodically and addressed through repeated revisions or updates of the base estimates.

### **3.5 SITE-SPECIFIC CONSIDERATIONS**

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impact of the considerations identified below is included in this cost study.

#### **3.5.1 Spent Fuel Management**

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimates to decommission St. Lucie. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the Nuclear Waste Policy Act. As such, the disposal cost is financed by a surcharge paid into the DOE's waste fund during operations. On November 19, 2013, the U.S. Court of Appeals for the D.C. Circuit ordered the Secretary of the Department of Energy to suspend collecting annual fees for nuclear waste disposal from nuclear power plant operators until the DOE has conducted a legally adequate fee assessment.

The NRC does, however, requires licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy. This requirement is prepared for through inclusion of certain high-level waste cost elements within the estimates, as described below.

Completion of the decommissioning process is highly dependent upon the DOE's ability to remove spent fuel from the site. The timing for removal of spent fuel from the site is based upon the DOE's most recently published annual acceptance rates of 400 MTU/year for year 1, 3,800 MTU total for years 2 through 4 and 3,000 MTU/year for year 5 and beyond. The DOE contracts provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing

priority acceptance from permanently shutdown nuclear reactors. Because it is unclear how these mechanisms may operate once DOE begins accepting spent fuel from commercial reactors, this study assumes that DOE will accept spent fuel in an oldest fuel first order.

### ISFSI

An ISFSI, which is operated under the plant's general license, has been constructed to support management of the spent fuel during operations. The facility is assumed to be available to support spent fuel management once the units cease operation, until the DOE is able to removal all spent fuel from the site.

The ISFSI will continue to operate throughout decommissioning, and beyond the termination of the operating license in the DECON decommissioning alternative, until such time that the transfer of spent fuel to the DOE can be completed. Assuming, conservatively, that DOE begins to remove spent fuel from the site in 2032, the process is expected to be completed by the year 2073. The scenario is similar for the SAFSTOR alternative; however, based upon the expected completion date for fuel transfer, the ISFSI will be emptied prior to the commencement of decommissioning operations.

Post-shutdown and maintenance costs for the spent fuel pools and the ISFSI are also included and address the cost for staffing the facility, as well as security, insurance, and licensing fees. Costs are provided for the final disposition of the facilities once the transfer is complete.

### Canister Design

A Transnuclear NUHOMS®-32PT system (with a 32 fuel assembly capacity) is assumed for future acquisitions. For fuel transferred directly from the pools to the DOE, the DOE is assumed to provide Transport, Aging and Disposal (TAD) canisters with a 32 assembly capacity. DOE has not provided details about the TAD canisters other than assembly capacity.

### Canister Loading and Transfer

The estimates include the cost for the labor and equipment to transfer and load each spent fuel canister into the DOE transport cask or to the ISFSI from the wet storage pools. Since the DOE has not published details about its cask system, this rough estimate is necessary. However,

use of this estimate should not be used to infer that TLG has any detailed information on the cask system DOE will ultimately provide.

### Operations and Maintenance

The estimates include the cost of operating and maintaining the spent fuel pools and the ISFSI, respectively. Pool operations are expected to continue approximately five and one half years after the cessation of operations. ISFSI operating costs are based upon a 30 year period of operations following the shutdown of Unit 2.

### ISFSI Decommissioning

In accordance with 10 CFR §72.30, licensees must have a proposed decommissioning plan for the ISFSI site and facilities that includes a cost estimate for the plan. The plan should contain sufficient information on the proposed practices and procedures for the decontamination of the ISFSI and for the disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor-related GTCC waste have been removed.

A multi-purpose (storage and transport) dry shielded canister (DSC) with a horizontal storage module (HSM) is used as a basis for the cost analyses. The HSMs are assumed to have some level of neutron-induced activation as a result of the long-term storage of the fuel, i.e., to levels exceeding free-release limits. As an allowance, a total of 14 NUHOMS modules are assumed to be affected, i.e., contain residual radioactivity. The allowance is based upon the number of modules required for the final core off-load (i.e., 217 offloaded assemblies, 32 assemblies per cask) which results in 7 DSCs per unit. It is assumed that these are the final modules offloaded; consequently they have the least time for radioactive decay of the neutron activation products.

No contamination or activation of the ISFSI pad is assumed. It would be expected that this assumption would be confirmed as a result of good radiological practice of surveying potentially impacted areas after each spent fuel transfer campaign. As such, only verification surveys are included for the pads in the decommissioning estimate. The estimate is limited to costs necessary to terminate the ISFSI's NRC license and meet the §20.1402 criteria for unrestricted use.

In accordance with the specific requirements of 10 CFR §72.30 for the ISFSI work scope, the cost estimate for decommissioning the ISFSI

reflects: 1) the cost of an independent contractor performing the decommissioning activities; 2) an adequate contingency factor; and 3) the cost of meeting the criteria for unrestricted use. The cost summary for decommissioning the ISFSIs is presented in Appendix E.

### GTCC

The dismantling of the reactor internals is expected to generate radioactive waste considered unsuitable for shallow land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. Although the DOE is responsible for disposing of GTCC waste, any costs for that service have not been determined. For purposes of this estimate, the GTCC radioactive waste has been assumed to be packaged in the same canisters used to store spent fuel and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel. The number of canisters required and the packaged volume for GTCC was based upon experience at Maine Yankee (e.g., the constraints on loading as identified in the canister's certificate of compliance).

It is assumed that the DOE would not accept this waste prior to completing the transfer of spent fuel. Therefore, until such time the DOE is ready to accept GTCC waste, it is assumed that this material would remain in storage at the St. Lucie site (for the DECON alternative). In the SAFSTOR scenario, the GTCC material is shipped directly to a DOE facility as it is generated since the fuel has been removed from the site prior to the start of decommissioning.

The estimates also include an additional GTCC canister (per unit) to accommodate the highly-activated legacy waste currently being stored in baskets in the spent fuel pool.

### 3.5.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is performed in the refueling canal, where a turntable and remote cutter are installed. The vessel is segmented in place, using a mast-mounted

cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology.

Intact disposal of reactor vessel shells has been successfully demonstrated at several of the sites that have been decommissioned. Access to navigable waterways has allowed these large packages to be transported to the Barnwell disposal site with minimal overland travel.

Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact package (including the internals). However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,
- there were no man-made or natural terrain features between the plant site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

It is not known whether this option will be available when the St. Lucie plant ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, the study assumes that the reactor vessel will require segmentation, as a bounding condition.

### 3.5.3 Primary System Components

In the DECON scenario, the reactor coolant system components are assumed to be decontaminated using chemical agents prior to the start of dismantling operations. This type of decontamination can be expected to have a significant ALARA impact, since in this scenario the removal work is done within the first few years of shutdown. A decontamination factor (average reduction) of 10 is assumed for the process. Disposal of the decontamination solution effluent is included within the estimate as a "process chemical waste" charge. In the SAFSTOR scenario, radionuclide decay is expected to provide the same benefit and, therefore, a chemical decontamination is not included.

The following discussion deals with the removal and disposition of the steam generators, but the techniques involved are also applicable to other large components, such as heat exchangers, component coolers, and the pressurizer. The steam generators' size and weight, as well as their location within the reactor building, will ultimately determine the removal strategy.

A trolley crane is set up for the removal of the generators. It can also be used to move portions of the steam generator cubicle walls and floor slabs from the reactor building to a location where they can be decontaminated and transported to the material handling area. Interferences within the work area, such as grating, piping, and other components are removed to create sufficient laydown space for processing these large components.

The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they are lowered onto a dolly. Each generator is rotated into the horizontal position for extraction from the containment and placed onto a multi-wheeled vehicle for transport to an on-site processing and storage area.

The generators are disassembled on-site with the steam domes and lightly contaminated subassemblies designated for off-site recycling. The more highly contaminated lower assembly containing the tube sheet and tube bundle are packaged for direct disposal. The interior volume is filled with low-density cellular concrete for stabilization of the internal contamination. Each component is then loaded onto a barge for transport to an intermediate processing facility then shipped by rail to the disposal facility.

The original steam generators and reactor closure heads have been replaced at both units (along with the Unit 1 pressurizer and a Unit 2 reactor coolant pump motor). The retired components have been shipped off-site for controlled disposal and are therefore not addressed in this analysis.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

#### 3.5.4 Main Turbine and Condenser

The main turbine is dismantled using conventional maintenance procedures. The turbine rotors and shafts are removed to a laydown area. The lower turbine casings are removed from their anchors by controlled demolition. The main condensers are also disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it is surveyed and designated for either decontamination or volume reduction, conventional disposal, or controlled disposal. Components are packaged and readied for transport in accordance with the intended disposition.

#### 3.5.5 Transportation Methods

Contaminated piping, components, and structural material other than the highly-activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.<sup>[26]</sup> The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in 49 CFR 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported in accordance with 10 CFR Part 71, in Type B containers. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that

the buildup of quantities of long-lived isotopes (e.g.,  $^{137}\text{Cs}$ ,  $^{90}\text{Sr}$ , or transuranics) has been prevented from reaching levels exceeding those that permit the major reactor components to be shipped under current transportation regulations and disposal requirements.

Transport of the highly-activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, barge, rail, and/or multi-wheeled transporter.

Transportation costs for Class A radioactive material requiring controlled disposal are based upon the mileage to the EnergySolutions' facility in Clive, Utah. Transportation costs for the higher activity Class B and C radioactive material are based upon the mileage to the WCS facility in Andrews County, Texas. The transportation cost for the GTCC material is assumed to be contained within the disposal cost. Transportation costs for off-site waste processing are based upon the mileage to Oak Ridge, Tennessee. Truck transport costs are developed from published tariffs from Tri-State Motor Transit.<sup>[27]</sup>

Contaminated soil is moved by truck to the nearest rail siding where it is loaded onto rail cars for transport to Utah. The waste containers, once emptied, are returned to the St. Lucie site for reuse.

### 3.5.6 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is processed to reduce the total cost of controlled disposal. Material meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning (preparing the material to meet the waste acceptance criteria of the disposal site) and recovery of the waste stream is performed off site at a licensed processing center. Any material leaving the site is subject to a survey and release charge, at a minimum.

The mass of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in the detailed Appendices C and D, and summarized in Section 5. The quantified waste summaries shown in these tables are consistent with 10 CFR Part 61 classifications. Commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The volumes are calculated based on the exterior package dimensions for containerized material or a specific calculation for components serving as their own waste containers.

The more highly-activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly-activated materials (greater than Class A waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

The cost to dispose of the lowest level waste and the majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at *EnergySolutions* facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon FPL's current agreement with WCS for the Andrews County facility.

### 3.5.7 Site Conditions Following Decommissioning

The NRC will amend or terminate the site license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Building codes and environmental regulations will dictate the next step in the decommissioning process, as well as owner's own future plans for the site.

Only existing site structures are considered in the dismantling cost. Buildings severely damaged in decontamination process are removed to a nominal depth of three feet below grade. Concrete rubble generated from demolition activities is processed and made available as clean fill

for the power block foundations. Excess construction debris is trucked off site as an alternative to onsite disposal.

A significant amount of the below grade piping is located around the perimeter of the power block. The estimate includes a cost to excavate this area to an average depth of four feet so as to expose the piping, duct bank, conduit, and any near-surface grounding grid. The overburden is surveyed and stockpiled on site for future use in backfilling the below grade voids.

### **3.6 ASSUMPTIONS**

The following are the major assumptions made in the development of the estimates for decommissioning the site.

#### **3.6.1 Estimating Basis**

Decommissioning costs are reported in the year of projected expenditure; however, the values are provided in 2015 dollars. Costs are not inflated, escalated, or discounted over the periods of performance.

The 2010 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. No changes to the plant systems that would impact decommissioning were identified.

The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

#### **3.6.2 Labor Costs**

FPL will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. The licensee will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract personnel will provide engineering services, e.g., for preparing

the activity specifications, work procedures, activation, and structural analyses, under the direction of the owner.

Reduction in the operating organization is assumed to be handled through normal staffing processes (e.g., reassignment and outplacement). Severance costs are not included for the plant operating staff or for the decommissioning organization.

Personnel costs are based upon average salary information provided by FPL. Overhead costs are included for site and corporate support, reduced commensurate with the staffing of the project.

The craft labor required to decontaminate and dismantle the nuclear units is acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis. Costs for site administration, operations, construction, and maintenance personnel are based upon average salary information provided by FPL.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel (in accordance with the requirements of 10 CFR Part 37, Part 72, and Part 73). Security costs include provisions for recurring expenses. Once the fuel has been transferred to the DOE in 2073, the security organization will be reduced to Part 37 requirements.

### 3.6.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., <sup>137</sup>Cs, <sup>90</sup>Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major nuclear steam supply system components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.<sup>[28]</sup> Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the St. Lucie components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from NUREG/CR-0130<sup>[29]</sup> and NUREG/CR-0672,<sup>[30]</sup> and benchmarked to the long-lived values from NUREG/CR-3474.

The control elements are disposed of along with the spent fuel, i.e., there is no additional cost provided for their disposal.

This study assumes that contamination (activation) of the containment building structure is confined to the biological shield.

#### Contaminated Soil

The estimates include an allowance for the remediation of contaminated soil and storm drains at several site areas that have been identified by FPL to contain concentrations of radionuclides in excess of NRC release limits. The areas include the primary and refueling water storage tanks, the east settling pond, storm drain system and the contaminated discharge canal dredge spoils pile. The requirements assumed for soil remediation may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

#### Asbestos and Hazardous Waste

The estimates include an allowance for the remediation of asbestos structural fireproofing coatings at Unit 1, removal of soil contaminated with diesel fuel and lubricating oil at both Unit 1 and Unit 2, and disposal of mixed/hazardous waste left over from plant operations.

### 3.6.4 General

#### Transition Activities

Existing warehouses are cleared of non-essential material and remain for use by FPL and its subcontractors. The warehouses are removed once they are no longer needed. The plant's operating staff performs the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.
- Process operating waste inventories. Disposal of operating wastes (e.g., filtration media, resins) during this initial period is not considered a decommissioning expense. The estimates

do not address the disposition of any legacy or retired components (except for the highly-activated material currently stored in the spent fuel pool and some mixed/hazardous wastes).

### Scrap and Salvage

The existing plant equipment is considered obsolete and suitable for scrap as deadweight quantities only. FPL will make economically reasonable efforts to salvage equipment following final plant shutdown. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the value that an owner may realize based upon those efforts.

It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be more than offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimates do not include the additional cost for size reduction and preparation to meet “furnace ready” conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation, an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property is removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts are also made available for alternative use.

### Energy

For estimating purposes, the plant is assumed to be de-energized, with the exception of those facilities associated with spent fuel storage.

Replacement power costs are used to calculate the cost of energy consumed during decommissioning for tooling, lighting, ventilation, and essential services.

### Emergency Planning

FEMA fees associated with emergency planning are assumed to continue for approximately 18 months following the cessation of operations. At this time, the fees are discontinued. The timing is based upon the anticipated condition of the spent fuel (i.e., the hottest spent fuel assemblies are assumed to be cool enough that no substantial Zircaloy oxidation and off-site event would occur with the loss of spent fuel pool water). State and local fees continue until all fuel has been removed from site.

### Insurance

Costs for continuing coverage (nuclear liability and property insurance) following cessation of plant operations and during decommissioning are included and based upon current operating premiums. Reductions in premiums, throughout the decommissioning process, are based upon the guidance provided in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning."<sup>[31]</sup> The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

### Taxes

Property taxes are included within the estimates. However, the tax is based upon the land, without any consideration of any ongoing site operations and property assets. The provided land values are applicable throughout decommissioning.

### Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

### Site Restoration

All structures will be removed except for the switchyard and discharge diffuser. The switchyard is required for grid operations. The discharge

diffuser will be removed at the breakaway flange and a plug welded in place. Structures to be removed include but are not limited to the reactor buildings, fuel handling buildings, reactor auxiliary buildings, intake structures, steam generator blowdown treatment building, and turbine buildings.

### **3.7 COST ESTIMATE SUMMARY**

Schedules of expenditures are provided in Tables 3.1 through 3.4. The tables delineate the cost contributors by year of expenditures as well as cost contributor (e.g., labor, materials, and waste disposal).

The tables in Appendices C and D provide additional detail. The cost elements in these tables are assigned to one of three subcategories: “License Termination,” “Spent Fuel Management,” and “Site Restoration.” The subcategory “License Termination” is used to accumulate costs that are consistent with “decommissioning” as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the plant’s operating license, recognizing that there may be some additional cost impact from spent fuel management. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). The basis for the ISFSI decommissioning cost that is included in Appendices C and D is provided in Appendix E.

The “Spent Fuel Management” subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the DOE and/or ISFSI for interim storage, as well as the transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pools and the management of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any cost related to the final disposal of the spent fuel. Under the terms of the settlement agreement with the DOE, there are activities and costs identified in the decommissioning cost study that are expected to be eligible for reimbursement (depending upon the timing of the activities).

“Site Restoration” is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade.

As discussed in Section 3.5.1, it is assumed that the DOE will not accept the GTCC waste prior to completing the transfer of spent fuel. Therefore, the cost of GTCC disposal is shown in the final year of ISFSI operation (for the DECON alternative). While designated for disposal at the federal facility along with the spent fuel, GTCC waste is still classified as low-level radioactive waste and, as such, included as a “License Termination” expense.

Decommissioning costs are reported in 2015 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure (or projected lifetime of the plant). The schedules are based upon the detailed activity costs reported in Appendices C and D, along with the timelines presented in Section 4.

The “Burial” column contains costs for the processing of low-level radioactive waste, as well as for the controlled disposal of material that cannot be recovered (released for unrestricted use). Since the following tables are often used in escalation analyses, costs associated with the disposition of GTCC have been reassigned to the “Other” column, commensurate with contractual payments for a one-time disposal service, although the cost is still reported in the “LLRW Disposal Costs” column in Appendices C and D and as a “Waste Disposal” cost in the summary tables (i.e., on pages xix, xx, 6-4 and 6-5). “Off-site Waste Processing,” separately reported in the summary tables, has been included in the “Burial” column as well.

**TABLE 3.1**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**INTEGRATED DECON**  
**TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036	40,602	5,906	2,896	37	6,237	55,677
2037	39,414	9,467	2,530	1,232	19,636	72,279
2038	16,644	11,926	691	15	4,554	33,830
2039	16,644	11,926	691	15	4,554	33,830
2040	16,690	11,958	693	15	4,567	33,923
2041	13,270	10,401	575	12	4,202	28,462
2042	6,550	7,365	345	6	3,501	17,768
2043	6,550	7,365	345	6	3,501	17,768
2044	21,764	3,414	2,544	25	3,002	30,748
2045	40,319	11,666	3,418	12,437	4,965	72,804
2046	53,163	22,056	3,281	23,136	10,812	112,448
2047	49,174	14,835	2,929	21,250	11,651	99,840
2048	45,459	7,908	2,598	19,488	12,493	87,946
2049	33,319	5,427	1,471	8,004	6,919	55,141
2050	17,275	8,957	402	5	1,564	28,203
2051	15,768	9,990	345	0	1,270	27,373
2052	2,968	1,197	11	0	1,272	5,448
2053	2,526	895	0	0	1,268	4,690
2054	2,526	895	0	0	1,268	4,690
2055	2,526	895	0	0	1,268	4,690
2056	2,533	898	0	0	1,272	4,702
2057	2,526	895	0	0	1,268	4,690
2058	2,526	895	0	0	1,268	4,690
2059	2,526	895	0	0	1,268	4,690
2060	2,533	898	0	0	1,272	4,702
2061	2,526	895	0	0	1,268	4,690
2062	2,526	895	0	0	1,268	4,690
2063	2,526	895	0	0	1,268	4,690
2064	2,533	898	0	0	1,272	4,702
2065	2,526	895	0	0	1,268	4,690
2066	2,526	895	0	0	1,268	4,690

**TABLE 3.1 (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**INTEGRATED DECON**  
**TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2067	2,526	895	0	0	1,268	4,690
2068	2,533	898	0	0	1,272	4,702
2069	2,526	895	0	0	1,268	4,690
2070	2,526	895	0	0	1,268	4,690
2071	2,526	895	0	0	1,268	4,690
2072	2,533	898	0	0	1,272	4,702
2073	2,504	2,576	4	42	16,568	21,693
2074	843	829	178	1,227	2,535	5,611
<b>Total</b>	<b>489,473</b>	<b>183,090</b>	<b>25,948</b>	<b>86,951</b>	<b>149,186</b>	<b>934,649</b>

**TABLE 3.1a**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**INTEGRATED DECON**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036	39,007	1,119	2,896	37	4,806	47,864
2037	33,543	4,676	2,299	1,232	17,713	59,464
2038	1	351	0	15	2,203	2,571
2039	1	351	0	15	2,203	2,571
2040	1	352	0	15	2,209	2,578
2041	1	317	0	12	1,880	2,210
2042	1	248	0	6	1,235	1,490
2043	1	248	0	6	1,235	1,490
2044	19,628	1,308	2,441	25	1,935	25,337
2045	39,286	11,645	3,418	12,437	4,403	71,189
2046	50,398	21,958	3,281	23,136	10,248	109,021
2047	47,692	14,477	2,929	21,250	11,089	97,438
2048	45,212	7,298	2,598	19,488	11,931	86,526
2049	32,714	3,665	1,471	8,004	6,359	52,214
2050	3,999	188	114	5	759	5,065
2051	49	0	0	0	418	467
2052	2	0	0	0	14	15
2053-72	0	0	0	0	0	0
2073	17	1,724	4	42	15,314	17,102
2074	497	198	120	1,227	2,496	4,538
<b>Total</b>	<b>312,051</b>	<b>70,125</b>	<b>21,572</b>	<b>86,951</b>	<b>98,450</b>	<b>589,149</b>

**TABLE 3.1b**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**INTEGRATED DECON**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036	1,596	4,787	0	0	1,431	7,813
2037	5,871	4,792	231	0	1,922	12,815
2038	16,643	11,574	691	0	2,351	31,260
2039	16,643	11,574	691	0	2,351	31,260
2040	16,689	11,606	693	0	2,357	31,345
2041	13,270	10,085	575	0	2,323	26,252
2042	6,549	7,117	345	0	2,266	16,278
2043	6,549	7,117	345	0	2,266	16,278
2044	1,938	2,106	102	0	1,067	5,213
2045	0	0	0	0	561	561
2046	0	0	0	0	561	561
2047	103	310	0	0	561	974
2048	203	610	0	0	562	1,376
2049	587	1,761	0	0	561	2,909
2050	1,552	1,720	0	0	802	4,075
2051	1,689	1,554	0	0	850	4,093
2052	2,505	920	0	0	1,258	4,683
2053	2,526	895	0	0	1,268	4,690
2054	2,526	895	0	0	1,268	4,690
2055	2,526	895	0	0	1,268	4,690
2056	2,533	898	0	0	1,272	4,702
2057	2,526	895	0	0	1,268	4,690
2058	2,526	895	0	0	1,268	4,690
2059	2,526	895	0	0	1,268	4,690
2060	2,533	898	0	0	1,272	4,702
2061	2,526	895	0	0	1,268	4,690
2062	2,526	895	0	0	1,268	4,690
2063	2,526	895	0	0	1,268	4,690
2064	2,533	898	0	0	1,272	4,702
2065	2,526	895	0	0	1,268	4,690
2066	2,526	895	0	0	1,268	4,690

**TABLE 3.1b (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**INTEGRATED DECON**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2067	2,526	895	0	0	1,268	4,690
2068	2,533	898	0	0	1,272	4,702
2069	2,526	895	0	0	1,268	4,690
2070	2,526	895	0	0	1,268	4,690
2071	2,526	895	0	0	1,268	4,690
2072	2,533	898	0	0	1,272	4,702
2073	2,487	851	0	0	1,253	4,591
2074	0	0	0	0	0	0
<b>Total</b>	<b>145,428</b>	<b>96,404</b>	<b>3,674</b>	<b>0</b>	<b>50,685</b>	<b>296,190</b>

**TABLE 3.1c  
ST. LUCIE NUCLEAR PLANT, UNIT 1  
INTEGRATED DECON  
SITE RESTORATION EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036	0	0	0	0	0	0
2037	0	0	0	0	0	0
2038	0	0	0	0	0	0
2039	0	0	0	0	0	0
2040	0	0	0	0	0	0
2041	0	0	0	0	0	0
2042	0	0	0	0	0	0
2043	0	0	0	0	0	0
2044	198	0	0	0	0	198
2045	1,033	21	0	0	1	1,054
2046	2,765	98	0	0	4	2,867
2047	1,378	48	0	0	2	1,428
2048	44	1	0	0	0	44
2049	18	0	0	0	0	18
2050	11,723	7,049	289	0	2	19,063
2051	14,029	8,436	345	0	3	22,813
2052	461	277	11	0	0	750
2053-73	0	0	0	0	0	0
2074	346	631	58	0	39	1,074
<b>Total</b>	<b>31,994</b>	<b>16,561</b>	<b>703</b>	<b>0</b>	<b>51</b>	<b>49,309</b>

**TABLE 3.2**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**DECON**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043	45,760	6,120	2,555	32	5,646	60,113
2044	72,239	20,336	5,173	16,018	16,966	130,733
2045	70,021	28,345	3,281	25,529	12,259	139,435
2046	57,548	24,197	2,882	19,445	11,387	115,458
2047	48,445	21,169	2,590	15,004	10,750	97,959
2048	47,443	20,434	2,482	14,356	10,360	95,074
2049	30,854	6,585	975	3,228	4,291	45,932
2050	20,686	8,013	402	5	1,986	31,092
2051	19,476	9,160	345	0	1,819	30,800
2052	3,233	1,003	11	0	1,291	5,538
2053	2,673	724	0	0	1,270	4,666
2054	2,673	724	0	0	1,270	4,666
2055	2,673	724	0	0	1,270	4,666
2056	2,680	726	0	0	1,273	4,679
2057	2,673	724	0	0	1,270	4,666
2058	2,673	724	0	0	1,270	4,666
2059	2,673	724	0	0	1,270	4,666
2060	2,680	726	0	0	1,273	4,679
2061	2,673	724	0	0	1,270	4,666
2062	2,673	724	0	0	1,270	4,666
2063	2,673	724	0	0	1,270	4,666
2064	2,680	726	0	0	1,273	4,679
2065	2,673	724	0	0	1,270	4,666
2066	2,673	724	0	0	1,270	4,666
2067	2,673	724	0	0	1,270	4,666
2068	2,680	726	0	0	1,273	4,679
2069	2,673	724	0	0	1,270	4,666
2070	2,673	724	0	0	1,270	4,666
2071	2,673	724	0	0	1,270	4,666
2072	2,680	726	0	0	1,273	4,679
2073	2,652	2,413	4	42	15,582	20,692

**TABLE 3.2 (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**DECON**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2074	843	829	178	1,227	2,535	5,611
Total	472,699	163,089	20,880	94,885	120,279	871,831

**TABLE 3.2a**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**DECON**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043	43,717	1,368	2,555	32	4,383	52,056
2044	68,699	15,483	5,173	16,018	15,308	120,681
2045	64,685	23,819	3,281	25,529	10,777	128,091
2046	52,582	14,050	2,882	19,445	9,763	98,721
2047	43,748	6,920	2,590	15,004	9,022	77,285
2048	42,970	6,874	2,482	14,356	8,739	75,420
2049	29,742	3,251	975	3,228	3,730	40,926
2050	4,452	192	114	5	375	5,137
2051	115	0	0	0	0	115
2052	4	0	0	0	0	4
2053-72	0	0	0	0	0	0
2073	17	1,724	4	42	14,327	16,115
2074	497	198	120	1,227	2,496	4,538
Total	351,228	73,880	20,176	94,885	78,919	619,088

**TABLE 3.2b  
ST. LUCIE NUCLEAR PLANT, UNIT 2  
DECON  
SPENT FUEL MANAGEMENT EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043	1,584	4,751	0	0	1,263	7,597
2044	1,607	4,820	0	0	1,658	8,084
2045	1,462	4,386	0	0	1,478	7,326
2046	3,268	9,803	0	0	1,478	14,548
2047	4,585	13,756	0	0	1,478	19,819
2048	4,371	13,113	0	0	1,394	18,878
2049	1,111	3,333	0	0	561	5,005
2050	2,070	166	0	0	960	3,196
2051	2,411	0	0	0	1,038	3,450
2052	2,672	702	0	0	1,265	4,639
2053	2,673	724	0	0	1,270	4,666
2054	2,673	724	0	0	1,270	4,666
2055	2,673	724	0	0	1,270	4,666
2056	2,680	726	0	0	1,273	4,679
2057	2,673	724	0	0	1,270	4,666
2058	2,673	724	0	0	1,270	4,666
2059	2,673	724	0	0	1,270	4,666
2060	2,680	726	0	0	1,273	4,679
2061	2,673	724	0	0	1,270	4,666
2062	2,673	724	0	0	1,270	4,666
2063	2,673	724	0	0	1,270	4,666
2064	2,680	726	0	0	1,273	4,679
2065	2,673	724	0	0	1,270	4,666
2066	2,673	724	0	0	1,270	4,666
2067	2,673	724	0	0	1,270	4,666
2068	2,680	726	0	0	1,273	4,679
2069	2,673	724	0	0	1,270	4,666
2070	2,673	724	0	0	1,270	4,666
2071	2,673	724	0	0	1,270	4,666
2072	2,680	726	0	0	1,273	4,679
2073	2,635	688	0	0	1,255	4,578

**TABLE 3.2b (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**DECON**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2074	0	0	0	0	0	0
Total	81,275	70,006	0	0	39,233	190,515

**TABLE 3.2c  
ST. LUCIE NUCLEAR PLANT, UNIT 2  
DECON  
SITE RESTORATION EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043	459	0	0	0	0	459
2044	1,934	33	0	0	1	1,968
2045	3,874	140	0	0	4	4,018
2046	1,699	344	0	0	147	2,189
2047	111	493	0	0	251	855
2048	101	447	0	0	227	775
2049	0	0	0	0	0	0
2050	14,164	7,654	289	0	652	22,759
2051	16,950	9,160	345	0	780	27,236
2052	557	301	11	0	26	895
2053-73	0	0	0	0	0	0
2074	346	631	58	0	39	1,074
<b>Total</b>	<b>40,195</b>	<b>19,203</b>	<b>703</b>	<b>0</b>	<b>2,127</b>	<b>62,228</b>

**TABLE 3.3  
ST. LUCIE NUCLEAR PLANT, UNIT 1  
SAFSTOR  
SCHEDULE OF TOTAL ANNUAL EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036	42,969	5,906	2,896	37	6,237	58,044
2037	39,989	9,343	2,538	1,231	19,638	72,739
2038	16,637	11,903	691	15	4,554	33,800
2039	16,637	11,903	691	15	4,554	33,800
2040	16,682	11,936	693	15	4,567	33,893
2041	12,607	8,441	574	12	3,569	25,204
2042	4,678	1,630	345	7	1,631	8,291
2043	4,678	1,630	345	7	1,631	8,291
2044	4,691	1,634	346	7	1,635	8,314
2045	4,678	1,630	345	7	1,631	8,291
2046	4,678	1,630	345	7	1,631	8,291
2047	4,678	1,630	345	7	1,631	8,291
2048	4,691	1,634	346	7	1,635	8,314
2049	4,678	1,630	345	7	1,631	8,291
2050	4,678	1,630	345	7	1,631	8,291
2051	4,678	1,630	345	7	1,631	8,291
2052	4,691	1,634	346	7	1,635	8,314
2053	4,678	1,630	345	7	1,631	8,291
2054	4,678	1,630	345	7	1,631	8,291
2055	4,678	1,630	345	7	1,631	8,291
2056	4,691	1,634	346	7	1,635	8,314
2057	4,678	1,630	345	7	1,631	8,291
2058	4,678	1,630	345	7	1,631	8,291
2059	4,678	1,630	345	7	1,631	8,291
2060	4,691	1,634	346	7	1,635	8,314
2061	4,678	1,630	345	7	1,631	8,291
2062	4,678	1,630	345	7	1,631	8,291
2063	4,678	1,630	345	7	1,631	8,291
2064	4,691	1,634	346	7	1,635	8,314
2065	4,678	1,630	345	7	1,631	8,291
2066	4,678	1,630	345	7	1,631	8,291

**TABLE 3.3 (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**SAFSTOR**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2067	4,678	1,630	345	7	1,631	8,291
2068	4,691	1,634	346	7	1,635	8,314
2069	4,678	1,630	345	7	1,631	8,291
2070	4,678	1,630	345	7	1,631	8,291
2071	4,678	1,630	345	7	1,631	8,291
2072	4,691	1,634	346	7	1,635	8,314
2073	4,670	1,626	345	7	1,629	8,278
2074	1,917	250	345	6	981	3,501
2075	1,917	250	345	6	981	3,501
2076	1,923	251	346	6	984	3,510
2077	1,917	250	345	6	981	3,501
2078	1,917	250	345	6	981	3,501
2079	1,917	250	345	6	981	3,501
2080	1,923	251	346	6	984	3,510
2081	1,917	250	345	6	981	3,501
2082	1,917	250	345	6	981	3,501
2083	1,917	250	345	6	981	3,501
2084	1,923	251	346	6	984	3,510
2085	1,917	250	345	6	981	3,501
2086	1,917	250	345	6	981	3,501
2087	1,917	250	345	6	981	3,501
2088	1,923	251	346	6	984	3,510
2089	40,500	4,409	3,190	33	2,147	50,280
2090	53,858	15,899	3,383	18,031	11,051	102,222
2091	53,955	22,282	3,175	24,396	21,004	124,813
2092	32,810	6,728	2,598	17,418	12,223	71,777
2093	32,721	6,709	2,590	17,371	12,190	71,581
2094	2,680	385	121	815	2,148	6,148
2095	14,683	706	407	20	1,877	17,692
2096	16,766	7,143	403	5	383	24,701
2097	15,277	8,296	345	0	59	23,978

**TABLE 3.3 (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**SAFSTOR**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2098	460	250	10	0	2	723
Total	587,805	188,188	40,551	79,720	173,156	1,069,419

**TABLE 3.3a**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**SAFSTOR**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036	41,374	1,119	2,896	37	4,806	50,231
2037	34,802	4,590	2,423	1,231	17,871	60,918
2038	1,918	351	345	15	2,667	5,297
2039	1,918	351	345	15	2,667	5,297
2040	1,923	352	346	15	2,675	5,311
2041	1,917	319	345	12	2,107	4,701
2042	1,917	254	345	7	1,005	3,528
2043	1,917	254	345	7	1,005	3,528
2044	1,923	255	346	7	1,008	3,538
2045	1,917	254	345	7	1,005	3,528
2046	1,917	254	345	7	1,005	3,528
2047	1,917	254	345	7	1,005	3,528
2048	1,923	255	346	7	1,008	3,538
2049	1,917	254	345	7	1,005	3,528
2050	1,917	254	345	7	1,005	3,528
2051	1,917	254	345	7	1,005	3,528
2052	1,923	255	346	7	1,008	3,538
2053	1,917	254	345	7	1,005	3,528
2054	1,917	254	345	7	1,005	3,528
2055	1,917	254	345	7	1,005	3,528
2056	1,923	255	346	7	1,008	3,538
2057	1,917	254	345	7	1,005	3,528
2058	1,917	254	345	7	1,005	3,528
2059	1,917	254	345	7	1,005	3,528
2060	1,923	255	346	7	1,008	3,538
2061	1,917	254	345	7	1,005	3,528
2062	1,917	254	345	7	1,005	3,528
2063	1,917	254	345	7	1,005	3,528
2064	1,923	255	346	7	1,008	3,538
2065	1,917	254	345	7	1,005	3,528
2066	1,917	254	345	7	1,005	3,528

**TABLE 3.3a (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**SAFSTOR**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2067	1,917	254	345	7	1,005	3,528
2068	1,923	255	346	7	1,008	3,538
2069	1,917	254	345	7	1,005	3,528
2070	1,917	254	345	7	1,005	3,528
2071	1,917	254	345	7	1,005	3,528
2072	1,923	255	346	7	1,008	3,538
2073	1,917	254	345	7	1,005	3,528
2074	1,917	250	345	6	981	3,501
2075	1,917	250	345	6	981	3,501
2076	1,923	251	346	6	984	3,510
2077	1,917	250	345	6	981	3,501
2078	1,917	250	345	6	981	3,501
2079	1,917	250	345	6	981	3,501
2080	1,923	251	346	6	984	3,510
2081	1,917	250	345	6	981	3,501
2082	1,917	250	345	6	981	3,501
2083	1,917	250	345	6	981	3,501
2084	1,923	251	346	6	984	3,510
2085	1,917	250	345	6	981	3,501
2086	1,917	250	345	6	981	3,501
2087	1,917	250	345	6	981	3,501
2088	1,923	251	346	6	984	3,510
2089	39,901	4,409	3,190	33	2,147	49,681
2090	51,385	15,845	3,383	18,031	11,049	99,693
2091	50,718	22,170	3,175	24,396	21,001	121,460
2092	32,772	6,727	2,598	17,418	12,223	71,738
2093	32,683	6,709	2,590	17,371	12,190	71,542
2094	2,678	385	121	815	2,148	6,146
2095	14,683	706	407	20	1,877	17,692
2096	4,055	188	114	5	334	4,695
2097	115	0	0	0	0	115

**TABLE 3.3a (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**SAFSTOR**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2098	3	0	0	0	0	3
Total	403,024	76,116	38,525	79,720	142,670	740,055

**TABLE 3.3b**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**SAFSTOR**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036	1,596	4,787	0	0	1,431	7,813
2037	5,187	4,752	115	0	1,767	11,821
2038	14,719	11,552	345	0	1,887	28,503
2039	14,719	11,552	345	0	1,887	28,503
2040	14,760	11,583	346	0	1,892	28,582
2041	10,689	8,123	229	0	1,462	20,503
2042	2,761	1,376	0	0	626	4,763
2043	2,761	1,376	0	0	626	4,763
2044	2,768	1,380	0	0	628	4,776
2045	2,761	1,376	0	0	626	4,763
2046	2,761	1,376	0	0	626	4,763
2047	2,761	1,376	0	0	626	4,763
2048	2,768	1,380	0	0	628	4,776
2049	2,761	1,376	0	0	626	4,763
2050	2,761	1,376	0	0	626	4,763
2051	2,761	1,376	0	0	626	4,763
2052	2,768	1,380	0	0	628	4,776
2053	2,761	1,376	0	0	626	4,763
2054	2,761	1,376	0	0	626	4,763
2055	2,761	1,376	0	0	626	4,763
2056	2,768	1,380	0	0	628	4,776
2057	2,761	1,376	0	0	626	4,763
2058	2,761	1,376	0	0	626	4,763
2059	2,761	1,376	0	0	626	4,763
2060	2,768	1,380	0	0	628	4,776
2061	2,761	1,376	0	0	626	4,763
2062	2,761	1,376	0	0	626	4,763
2063	2,761	1,376	0	0	626	4,763
2064	2,768	1,380	0	0	628	4,776
2065	2,761	1,376	0	0	626	4,763
2066	2,761	1,376	0	0	626	4,763

**TABLE 3.3b (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**SAFSTOR**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2067	2,761	1,376	0	0	626	4,763
2068	2,768	1,380	0	0	628	4,776
2069	2,761	1,376	0	0	626	4,763
2070	2,761	1,376	0	0	626	4,763
2071	2,761	1,376	0	0	626	4,763
2072	2,768	1,380	0	0	628	4,776
2073	2,753	1,372	0	0	624	4,749
2074-98	0	0	0	0	0	0
<b>Total</b>	<b>150,062</b>	<b>96,404</b>	<b>1,381</b>	<b>0</b>	<b>30,370</b>	<b>278,217</b>

**TABLE 3.3c**  
**ST. LUCIE NUCLEAR PLANT, UNIT 1**  
**SAFSTOR**  
**SITE RESTORATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036-88	0	0	0	0	0	0
2089	599	0	0	0	0	599
2090	2,473	54	0	0	2	2,529
2091	3,237	112	0	0	3	3,353
2092	38	1	0	0	0	39
2093	38	1	0	0	0	38
2094	2	0	0	0	0	2
2095	0	0	0	0	0	0
2096	12,712	6,955	290	0	50	20,006
2097	15,163	8,296	345	0	59	23,863
2098	457	250	10	0	2	719
<b>Total</b>	<b>34,719</b>	<b>15,668</b>	<b>645</b>	<b>0</b>	<b>116</b>	<b>51,148</b>

**TABLE 3.4  
ST. LUCIE NUCLEAR PLANT, UNIT 2  
SAFSTOR  
TOTAL ANNUAL EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043	36,003	5,739	2,555	32	5,524	49,853
2044	43,392	10,801	2,812	1,245	15,216	73,466
2045	15,920	9,644	691	15	3,621	29,890
2046	15,920	9,644	691	15	3,621	29,890
2047	15,920	9,644	691	15	3,621	29,890
2048	13,185	7,619	608	13	3,127	24,553
2049	4,526	1,234	345	7	1,556	7,667
2050	4,526	1,234	345	7	1,556	7,667
2051	4,526	1,234	345	7	1,556	7,667
2052	4,538	1,237	346	7	1,560	7,688
2053	4,526	1,234	345	7	1,556	7,667
2054	4,526	1,234	345	7	1,556	7,667
2055	4,526	1,234	345	7	1,556	7,667
2056	4,538	1,237	346	7	1,560	7,688
2057	4,526	1,234	345	7	1,556	7,667
2058	4,526	1,234	345	7	1,556	7,667
2059	4,526	1,234	345	7	1,556	7,667
2060	4,538	1,237	346	7	1,560	7,688
2061	4,526	1,234	345	7	1,556	7,667
2062	4,526	1,234	345	7	1,556	7,667
2063	4,526	1,234	345	7	1,556	7,667
2064	4,538	1,237	346	7	1,560	7,688
2065	4,526	1,234	345	7	1,556	7,667
2066	4,526	1,234	345	7	1,556	7,667
2067	4,526	1,234	345	7	1,556	7,667
2068	4,538	1,237	346	7	1,560	7,688
2069	4,526	1,234	345	7	1,556	7,667
2070	4,526	1,234	345	7	1,556	7,667
2071	4,526	1,234	345	7	1,556	7,667
2072	4,538	1,237	346	7	1,560	7,688
2073	4,518	1,231	345	7	1,554	7,655

**TABLE 3.4 (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**SAFSTOR**  
**TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2074	1,930	264	345	6	982	3,527
2075	1,930	264	345	6	982	3,527
2076	1,935	264	346	6	984	3,536
2077	1,930	264	345	6	982	3,527
2078	1,930	264	345	6	982	3,527
2079	1,930	264	345	6	982	3,527
2080	1,935	264	346	6	984	3,536
2081	1,930	264	345	6	982	3,527
2082	1,930	264	345	6	982	3,527
2083	1,930	264	345	6	982	3,527
2084	1,935	264	346	6	984	3,536
2085	1,930	264	345	6	982	3,527
2086	1,930	264	345	6	982	3,527
2087	1,930	264	345	6	982	3,527
2088	1,935	264	346	6	984	3,536
2089	1,930	264	345	6	982	3,527
2090	25,268	2,575	2,934	28	2,002	32,807
2091	40,184	12,505	3,398	14,693	9,009	79,788
2092	55,740	24,469	3,233	25,994	21,555	130,991
2093	44,428	7,416	2,590	16,340	10,527	81,302
2094	44,428	7,416	2,590	16,340	10,527	81,302
2095	32,682	3,735	1,471	6,732	5,395	50,016
2096	18,551	8,538	403	5	778	28,275
2097	17,327	9,955	345	0	572	28,199
2098	522	300	10	0	17	850
Total	563,568	165,079	39,196	81,733	149,743	999,319

**TABLE 3.4a**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**SAFSTOR**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043	34,419	988	2,555	32	4,261	42,255
2044	38,833	4,829	2,731	1,245	13,465	61,102
2045	1,930	365	345	15	1,745	4,400
2046	1,930	365	345	15	1,745	4,400
2047	1,930	365	345	15	1,745	4,400
2048	1,935	342	346	13	1,566	4,202
2049	1,930	267	345	7	992	3,541
2050	1,930	267	345	7	992	3,541
2051	1,930	267	345	7	992	3,541
2052	1,935	268	346	7	994	3,550
2053	1,930	267	345	7	992	3,541
2054	1,930	267	345	7	992	3,541
2055	1,930	267	345	7	992	3,541
2056	1,935	268	346	7	994	3,550
2057	1,930	267	345	7	992	3,541
2058	1,930	267	345	7	992	3,541
2059	1,930	267	345	7	992	3,541
2060	1,935	268	346	7	994	3,550
2061	1,930	267	345	7	992	3,541
2062	1,930	267	345	7	992	3,541
2063	1,930	267	345	7	992	3,541
2064	1,935	268	346	7	994	3,550
2065	1,930	267	345	7	992	3,541
2066	1,930	267	345	7	992	3,541
2067	1,930	267	345	7	992	3,541
2068	1,935	268	346	7	994	3,550
2069	1,930	267	345	7	992	3,541
2070	1,930	267	345	7	992	3,541
2071	1,930	267	345	7	992	3,541
2072	1,935	268	346	7	994	3,550
2073	1,930	267	345	7	992	3,541

**TABLE 3.4a (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**SAFSTOR**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2074	1,930	264	345	6	982	3,527
2075	1,930	264	345	6	982	3,527
2076	1,935	264	346	6	984	3,536
2077	1,930	264	345	6	982	3,527
2078	1,930	264	345	6	982	3,527
2079	1,930	264	345	6	982	3,527
2080	1,935	264	346	6	984	3,536
2081	1,930	264	345	6	982	3,527
2082	1,930	264	345	6	982	3,527
2083	1,930	264	345	6	982	3,527
2084	1,935	264	346	6	984	3,536
2085	1,930	264	345	6	982	3,527
2086	1,930	264	345	6	982	3,527
2087	1,930	264	345	6	982	3,527
2088	1,935	264	346	6	984	3,536
2089	1,930	264	345	6	982	3,527
2090	25,034	2,575	2,934	28	2,002	32,574
2091	38,090	12,446	3,398	14,693	9,008	77,634
2092	50,989	24,262	3,233	25,994	21,530	126,008
2093	44,317	6,925	2,590	16,340	10,277	80,450
2094	44,317	6,925	2,590	16,340	10,277	80,450
2095	32,636	3,533	1,471	6,732	5,293	49,666
2096	4,066	192	114	5	298	4,675
2097	49	0	0	0	0	49
2098	1	0	0	0	0	1
Total	399,644	75,023	37,171	81,733	123,735	717,305

**TABLE 3.4b**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**SAFSTOR**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043	1,584	4,751	0	0	1,263	7,597
2044	4,558	5,973	81	0	1,751	12,364
2045	13,990	9,279	345	0	1,876	25,491
2046	13,990	9,279	345	0	1,876	25,491
2047	13,990	9,279	345	0	1,876	25,491
2048	11,250	7,277	262	0	1,561	20,351
2049	2,596	966	0	0	564	4,126
2050	2,596	966	0	0	564	4,126
2051	2,596	966	0	0	564	4,126
2052	2,603	969	0	0	566	4,137
2053	2,596	966	0	0	564	4,126
2054	2,596	966	0	0	564	4,126
2055	2,596	966	0	0	564	4,126
2056	2,603	969	0	0	566	4,137
2057	2,596	966	0	0	564	4,126
2058	2,596	966	0	0	564	4,126
2059	2,596	966	0	0	564	4,126
2060	2,603	969	0	0	566	4,137
2061	2,596	966	0	0	564	4,126
2062	2,596	966	0	0	564	4,126
2063	2,596	966	0	0	564	4,126
2064	2,603	969	0	0	566	4,137
2065	2,596	966	0	0	564	4,126
2066	2,596	966	0	0	564	4,126
2067	2,596	966	0	0	564	4,126
2068	2,603	969	0	0	566	4,137
2069	2,596	966	0	0	564	4,126
2070	2,596	966	0	0	564	4,126
2071	2,596	966	0	0	564	4,126
2072	2,603	969	0	0	566	4,137
2073	2,589	964	0	0	562	4,115

**TABLE 3.4b (continued)**  
**ST. LUCIE NUCLEAR PLANT, UNIT 2**  
**SAFSTOR**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2074-98	0	0	0	0	0	0
Total	124,296	70,006	1,380	0	24,311	219,993

**TABLE 3.4c  
ST. LUCIE NUCLEAR PLANT, UNIT 2  
SAFSTOR  
SITE RESTORATION EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043-89	0	0	0	0	0	0
2090	233	0	0	0	0	233
2091	2,094	59	0	0	1	2,154
2092	4,751	207	0	0	24	4,982
2093	111	491	0	0	250	852
2094	111	491	0	0	250	852
2095	46	202	0	0	103	350
2096	14,485	8,346	290	0	479	23,599
2097	17,277	9,955	345	0	572	28,150
2098	521	300	10	0	17	848
<b>Total</b>	<b>39,629</b>	<b>20,051</b>	<b>645</b>	<b>0</b>	<b>1,697</b>	<b>62,022</b>

**TABLE 3.5**  
**SUMMARY OF COSTS**  
**SHARED SYSTEMS and STRUCTURES**  
(thousands, 2015 dollars)

	UNIT 1	UNIT 2	TOTAL
<b>STRUCTURES</b>			
Contaminated Soil	29,194	27,123	56,318
Mixed/Hazardous Waste	6,863	6,863	13,727
Shared Miscellaneous Site Structures	0	4,631	4,631
Steam Generator Blowdown Treatment Facility	0	615	615
Subtotal	36,058	39,234	75,291

**SYSTEMS**

Auxiliary Steam - Insulated	27	19	47
Condensate Polish Filter Demin	28	0	28
Condensate Polish Filter Demin - Ins	83	0	83
Demineralized Makeup Water - RCA	37	19	56
Demineralized Makeup Water	18	6	24
Domestic/Makeup/Service Water	210	10	220
Domestic/Makeup/Service Water-Ins	4	1	5
Domestic/Makeup/Service Water-Ins-RCA	35	0	35
Domestic/Makeup/Service Water - RCA	304	71	375
Fire Protection	82	63	145
Fire Protection - Insulated	8	7	15
Fire Protection - Insulated - RCA	6	17	23
Fire Protection - RCA	76	193	269
Neutralization Basin Recirculation	21	0	21
Primary Water	670	639	1,310
Primary Water - Insulated	7	7	14
Service & Instrument Air	30	23	53
Service & Instrument Air - Ins	15	12	27
Service & Instrument Air - Ins - RCA	172	117	288
Service & Instrument Air - Ins	15	12	27

**TABLE 3.5 (continued)**  
**SUMMARY OF COSTS**  
**SHARED SYSTEMS and STRUCTURES**  
(thousands, 2015 dollars)

	UNIT 1	UNIT 2	TOTAL
<b>SYSTEMS (continued)</b>			
SGBTF Blowdown - Insulated	28	2,063	2,091
SGBTF Demin - Ins - RCA	0	136	136
SGBTF Demin - RCA	0	239	239
SGBTF HVAC	67	0	67
SGBTF Misc - RCA	16	0	16
SGBTF Miscellaneous - RCA	0	84	84
SGBTF Waste Management	12	185	197
SGBTF Waste Management - Insulated	115	158	272
Sodium Hypochlorite	0	54	54
Water Treatment - Insulated	46	0	46
Water Treatment	80	0	80
Subtotal	2,213	4,134	6,347
<b>MISCELLANEOUS COMPONENTS *</b>			
Clean Miscellaneous Components			27
Contaminated Miscellaneous Component			124
Subtotal			151
<b>TOTAL</b>			<b>81,789</b>

\* Includes Shared Refueling Equipment (20), Valves & Piping for Condensate Storage Tank Interconnection, Turbine Lube Oil Storage Tank, Waste Oil Storage Tank, Miscellaneous Small Bore Piping, Valves & Piping for Holdup Tanks Interconnection, Valves & Piping for Aerated Waste Storage Tank Interconnect, SGBTF Electrical (9), Tank, Valves, Piping - UHS Valves & Emergency Air, and Piping for Waste Management System Interconnects

### **3.8 COST RECOVERY**

As discussed earlier, FPL filed a lawsuit in 2004 claiming damages for DOE's failure to perform as originally prescribed in the standard disposal contract.

On March 31, 2009, FPL executed a Settlement Agreement with the DOE and the Department of Justice (DoJ). In the Agreement, FPL settled the lawsuit in exchange for payments. The payments are intended to cover those costs incurred for managing and storing the spent fuel that it would not have incurred but for DOE's delay in performance.

While the DOE is responsible for the costs incurred until it fulfills its obligation, certain assumptions are needed to assess the financial impact on the previously identified decommissioning cost scenarios. The assumptions and methodology employed to quantify the expected level of compensation are as follows:

1. DOE Acceptance Obligations are defined based on the 1995 Acceptance Priority Ranking & Annual Capacity Report Table 1 acceptance rate from Year 1 to Year 10, with a continued steady state acceptance rate of 900 metric tons of uranium (MTU) per year until December 31, 2014 and 2,100 MTU/year thereafter as per the Settlement Agreement.
2. At the time the aggregate MTUs actually accepted by the DOE equals the aggregate MTUs allocated to FPL under the 1995 Acceptance Priority Ranking & Annual Capacity Report, the DOE's compensation obligation ceases.
3. The pickup of commercial fuel is assumed to begin in the year 2030. The first fuel from St. Lucie is expected to be transferred to the DOE in 2032, again assuming commercial fuel is accepted on an oldest fuel first basis.<sup>†</sup> The rate of transfer was based upon an annual acceptance capacity at the geologic repository of 3,000 metric tons.

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<sup>†</sup> DOE's contracts with utilities order the acceptance of spent fuel from utilities based upon the oldest fuel receiving the highest priority. While DOE's acceptance priority ranking is based on the date that spent nuclear fuel was permanently discharged, with the oldest spent nuclear fuel, on an industry-wide basis, given the higher priority, the generator has the right to determine which spent nuclear fuel is delivered, provided that it is in compliance with the Standard Contract. DOE contracts also provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing priority acceptance from permanently shutdown nuclear reactors.

The pickup schedule reflected in the 1995 Acceptance Priority Ranking & Annual Capacity Report is based upon an earlier start date (1998), but a lower rate of acceptance than that considered in the St. Lucie decommissioning analysis. As shown in Table 3.6, the two different pickup rates would achieve the same level of performance (equivalent number of St. Lucie spent fuel assemblies received by the DOE) in the year 2063 (approximately ten years before the ISFSI would be decommissioned). Under the terms of the Settlement Agreement, if the DOE follows the pickup rate, its compensation obligation would terminate when this milestone is reached. Under this scenario, the DOE would provide no compensation after 2063.

4. This analysis addresses only those costs identified as spent fuel management costs in the decommissioning cost analysis (as delineated in the detailed cost tables in Appendix C and D). While the estimates do assign costs to spent fuel management during the active decommissioning period, the cost elements are generally limited in scope to the direct costs associated with purchasing DSCs and HSMs, loading and packaging the spent fuel into the canisters for long-term storage at the plant's ISFSI (or into TADs for direct transfer to the DOE). No attempt was made, for this analysis, to identify any additional ISFSI related costs during this time period that may also be eligible for reimbursement by DOE under the Agreement.

As shown on the graph at the bottom of Table 3.6, it is projected that the DOE will meet its obligation for cumulative acceptance of spent fuel in the year 2063, based upon the assumptions delineated in the decommissioning cost analysis. Costs incurred for spent fuel management prior to this time (conservatively, December 31, 2062) can be expected to be reimbursed. Costs incurred after that time would not be eligible. Each year, the claim requesting the prior year's costs is submitted for payment on or before April 30.

The activities (at a minimum), identified in the decommissioning cost study and expected to be eligible for reimbursement (depending upon the timing of the activities) are identified below.

- I. Active Decommissioning (until the Operating Licenses are terminated)
  - Spent Fuel Capital and Transfer
  - ISFSI Operating Costs
  - Emergency Planning Fees (once the spent fuel pool is emptied)

II. Site Restoration (with concurrent ISFSI Operations)

- Spent Fuel Capital and Transfer
- Insurance
- Energy
- NRC ISFSI Fees
- Emergency Planning Fees
- ISFSI Operating Costs
- Security Staff (allocation)
- Plant Staff (allocation)

III. Post-Decommissioning ISFSI Operations

- Spent Fuel Transfer
- Insurance
- Property Taxes
- NRC ISFSI Fees
- Emergency Planning Fees
- ISFSI Operating Costs
- Security Staff
- Plant Staff

The costs eligible for reimbursement would still be incurred over the life of decommissioning project. However, they will be recovered on an ongoing basis (i.e., the year after expenditure). Tables 3.7 and 3.8 identify the income stream that can be expected to offset spent fuel management expenses for the decommissioning scenarios. Under the current assumptions, costs incurred in the year 2063 and beyond would not be eligible for reimbursement.

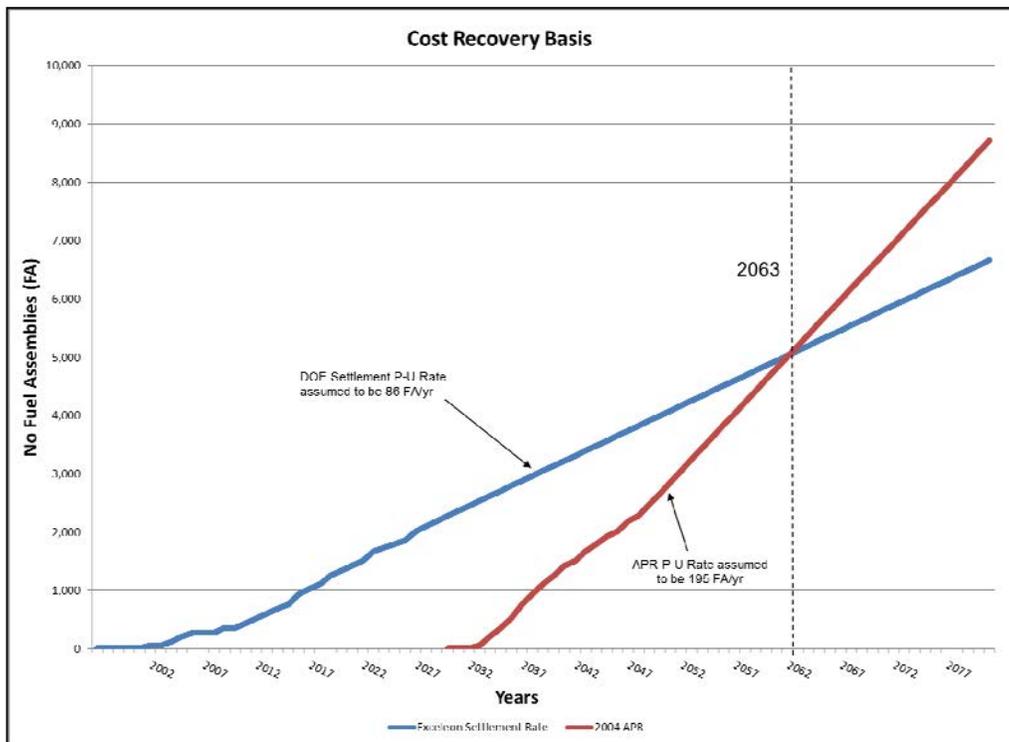
Table 3.9 identifies cost to decommission the ISFSI. While the costs are incurred after 2063, they may also be reimbursable since ISFSI construction was in response to delays in the timely removal of spent fuel from the site.

**TABLE 3.6**  
**ST. LUCIE NUCLEAR PLANT**  
**SPENT FUEL MANAGEMENT**

Year	Fuel Assembly Inventory		Spent Fuel Acceptance	
	Assemblies in Pool	Assemblies at ISFSI	St. Lucie Projections (based upon 2004 APR)	DOE Obligations (based on 1995 APR and Settlement Agreement)
2030	2,792	2,528	2,278	-
2031	2,876	2,528	2,364	-
2032	2,932	2,528	2,450	-
2033	3,008	2,528	2,536	52
2034	2,808	2,528	2,622	208
2035	2,864	2,528	2,708	359
2036	2,977	2,528	2,794	524
2037	2,753	2,528	2,880	764
2038	2,681	2,528	2,966	931
2039	2,605	2,528	3,052	1,108
2040	2,445	2,528	3,138	1,260
2041	1,280	3,589	3,224	1,424
2042	1,208	3,589	3,310	1,508
2043	1,233	3,589	3,396	1,673
2044	1,105	3,589	3,482	1,796
2045	945	3,589	3,568	1,934
2046	817	3,589	3,654	2,011
2047	625	3,589	3,740	2,185
2048	0	4,086	3,826	2,278
2049		3,926	3,912	2,473
2050		3,766	3,998	2,668
2051		3,606	4,084	2,863
2052		3,446	4,170	3,058
2053		3,286	4,256	3,253
2054		3,126	4,342	3,448
2055		2,966	4,428	3,643
2056		2,806	4,514	3,838
2057		2,646	4,600	4,033
2058		2,486	4,686	4,228
2059		2,326	4,772	4,423
2060		2,166	4,858	4,618

**TABLE 3.6 (continued)**  
**ST. LUCIE NUCLEAR PLANT**  
**SPENT FUEL MANAGEMENT**

Year	Fuel Assembly Inventory		Spent Fuel Acceptance	
	Assemblies in Pool	Assemblies at ISFSI	St. Lucie Projections (based upon 2004 APR)	DOE Obligations (based on 1995 APR and Settlement Agreement)
2061		2,006	4,813	4,944
2062		1,846	5,008	5,030
2063		1,686	5,203	5,116
2064		1,537	5,398	5,202
2065		1,377	5,593	5,288
2066		1,217	5,788	5,374
2067		1,057	5,983	5,460
2068		897	6,178	5,546
2069		737	6,373	5,632
2070		577	6,568	5,718
2071		417	6,763	5,804
2072		193	6,958	5,890
2073		0	7,153	5,976



**TABLE 3.7  
ST. LUCIE NUCLEAR PLANT, UNIT 1  
INTEGRATED DECON  
COSTS RECOVERED FOR SPENT FUEL MANAGEMENT  
(thousands, 2015 dollars)**

Year*	Labor	Equipment & Materials	Transport	Burial	Other	Total
2036						
2037	1,596	4,787	0	0	47	6,429
2038	1,597	4,792	0	0	56	6,445
2039	3,858	11,574	0	0	56	15,489
2040	3,858	11,574	0	0	56	15,489
2041	3,869	11,606	0	0	56	15,531
2042	3,362	10,085	0	0	225	13,671
2043	2,372	7,117	0	0	561	10,050
2044	2,372	7,117	0	0	561	10,050
2045	702	2,106	0	0	562	3,370
2046	0	0	0	0	561	561
2047	0	0	0	0	561	561
2048	103	310	0	0	561	974
2049	203	610	0	0	562	1,376
2050	587	1,761	0	0	561	2,909
2051	1,552	1,720	0	0	802	4,075
2052	1,689	1,554	0	0	850	4,093
2053	2,505	920	0	0	1,258	4,683
2054	2,526	895	0	0	1,268	4,690
2055	2,526	895	0	0	1,268	4,690
2056	2,526	895	0	0	1,268	4,690
2057	2,533	898	0	0	1,272	4,702
2058	2,526	895	0	0	1,268	4,690
2059	2,526	895	0	0	1,268	4,690
2060	2,526	895	0	0	1,268	4,690
2061	2,533	898	0	0	1,272	4,702
2062	2,526	895	0	0	1,268	4,690
2063	2,526	895	0	0	1,268	4,690
<b>Total</b>	<b>55,499</b>	<b>86,591</b>	<b>0</b>	<b>0</b>	<b>20,585</b>	<b>162,675</b>

\* Costs expended in prior year

**TABLE 3.8  
ST. LUCIE NUCLEAR PLANT, UNIT 2  
DECON  
COSTS RECOVERED FOR SPENT FUEL MANAGEMENT  
(thousands, 2015 dollars)**

Year*	Labor	Equipment & Materials	Transport	Burial	Other	Total
2043						
2044	1,584	4,751	0	0	42	6,376
2045	1,607	4,820	0	0	56	6,483
2046	1,462	4,386	0	0	56	5,905
2047	3,268	9,803	0	0	56	13,127
2048	4,585	13,756	0	0	56	18,398
2049	4,371	13,114	0	0	105	17,589
2050	1,111	3,333	0	0	561	5,005
2051	55	166	0	0	960	1,182
2052	0	0	0	0	1,038	1,038
2053	2,593	702	0	0	1,265	4,560
2054	2,673	724	0	0	1,270	4,666
2055	2,673	724	0	0	1,270	4,666
2056	2,673	724	0	0	1,270	4,666
2057	2,680	726	0	0	1,273	4,679
2058	2,673	724	0	0	1,270	4,666
2059	2,673	724	0	0	1,270	4,666
2060	2,673	724	0	0	1,270	4,666
2061	2,680	726	0	0	1,273	4,679
2062	2,673	724	0	0	1,270	4,666
2063	2,673	724	0	0	1,270	4,666
<b>Total</b>	<b>47,382</b>	<b>62,074</b>	<b>0</b>	<b>0</b>	<b>16,898</b>	<b>126,353</b>

\* Costs expended in prior year

**TABLE 3.9  
ST. LUCIE NUCLEAR PLANT  
ISFSI DECOMMISSIONING  
COSTS RECOVERED FOR SPENT FUEL MANAGEMENT**  
(thousands, 2015 dollars)

Year <sup>[1]</sup>	Labor <sup>[3]</sup>	Equipment & Materials <sup>[3]</sup>	Transport <sup>[3]</sup>	Burial <sup>[3]</sup>	Other <sup>[3]</sup>	Total <sup>[2]</sup>
2074						
2075	1,028	409	249	2,537	5,162	9,385
Total	1,028	409	249	2,537	5,162	9,385

- Notes: 1. Costs are expended in prior year
2. Costs are divided evenly between the units in the cost estimates and schedules of expenditure
3. Costs as found in Appendices C and D

## **4. SCHEDULE ESTIMATE**

The schedules for the decommissioning scenarios considered in this study follow the sequences presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plan described in Section 3.5.1.

A schedule or sequence of activities for the DECON alternative is presented in Figure 4.1. The schedule is also representative of the work activities identified in the delayed dismantling phase of SAFSTOR, absent any spent fuel constraints.

The scheduling sequence is based on the fuel being removed from the spent fuel pools within five and one half years. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project Professional 2010" computer software.<sup>[32]</sup>

### **4.1 SCHEDULE ESTIMATE ASSUMPTIONS**

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual man-hour estimates from the cost table, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the DECON decommissioning schedule:

- The fuel handling area is isolated until such time that all spent fuel has been discharged from the spent fuel pools to the DOE or to the ISFSI. Decontamination and dismantling of the storage pools are initiated once the transfer of spent fuel to the ISFSI or DOE is complete.
- All work (except reactor vessel and reactor vessel internals removal and the spent fuel storage campaigns) is performed during an 8-hour workday, 5 days per week, with no overtime.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal

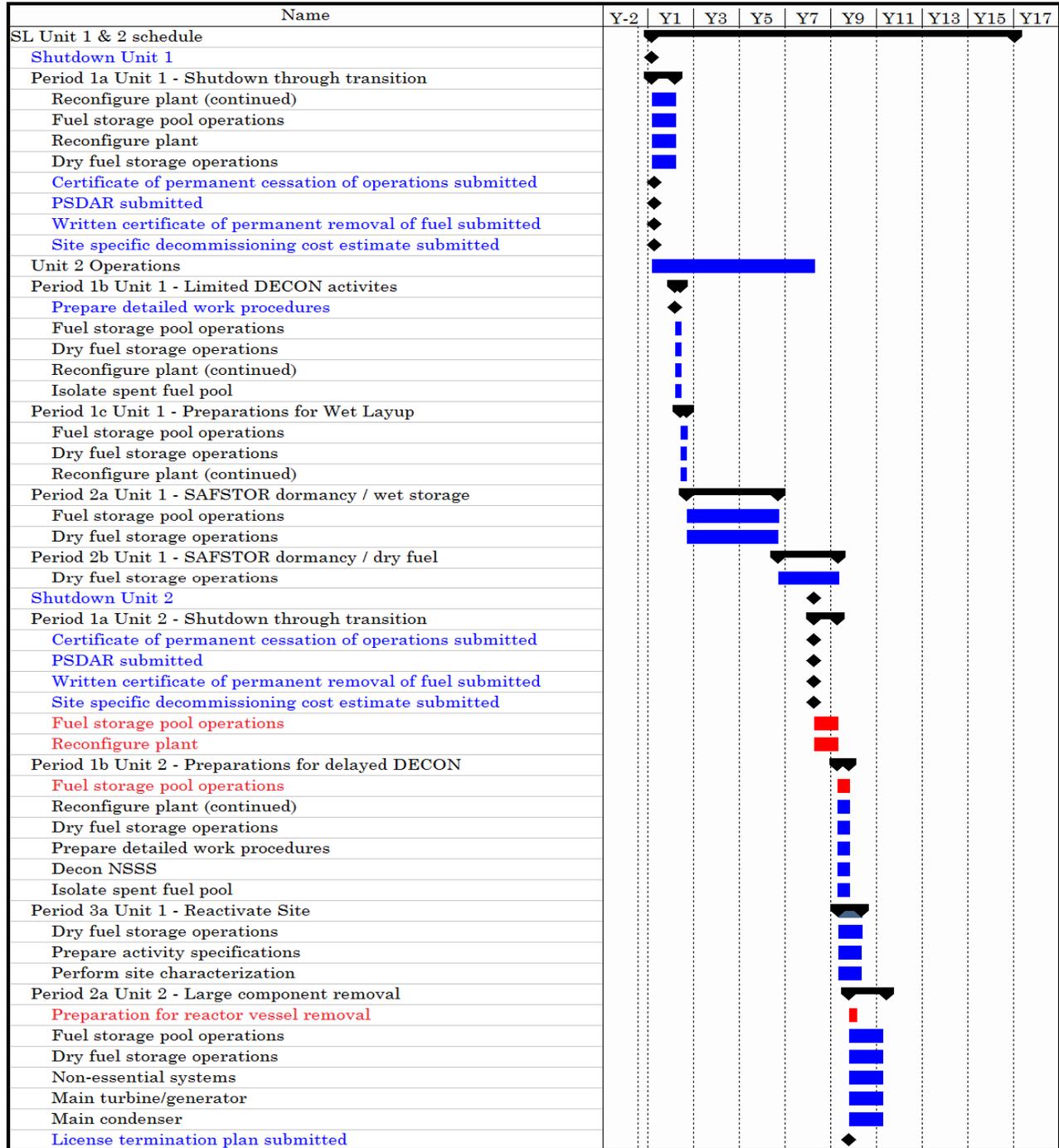
and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.

## **4.2 PROJECT SCHEDULE**

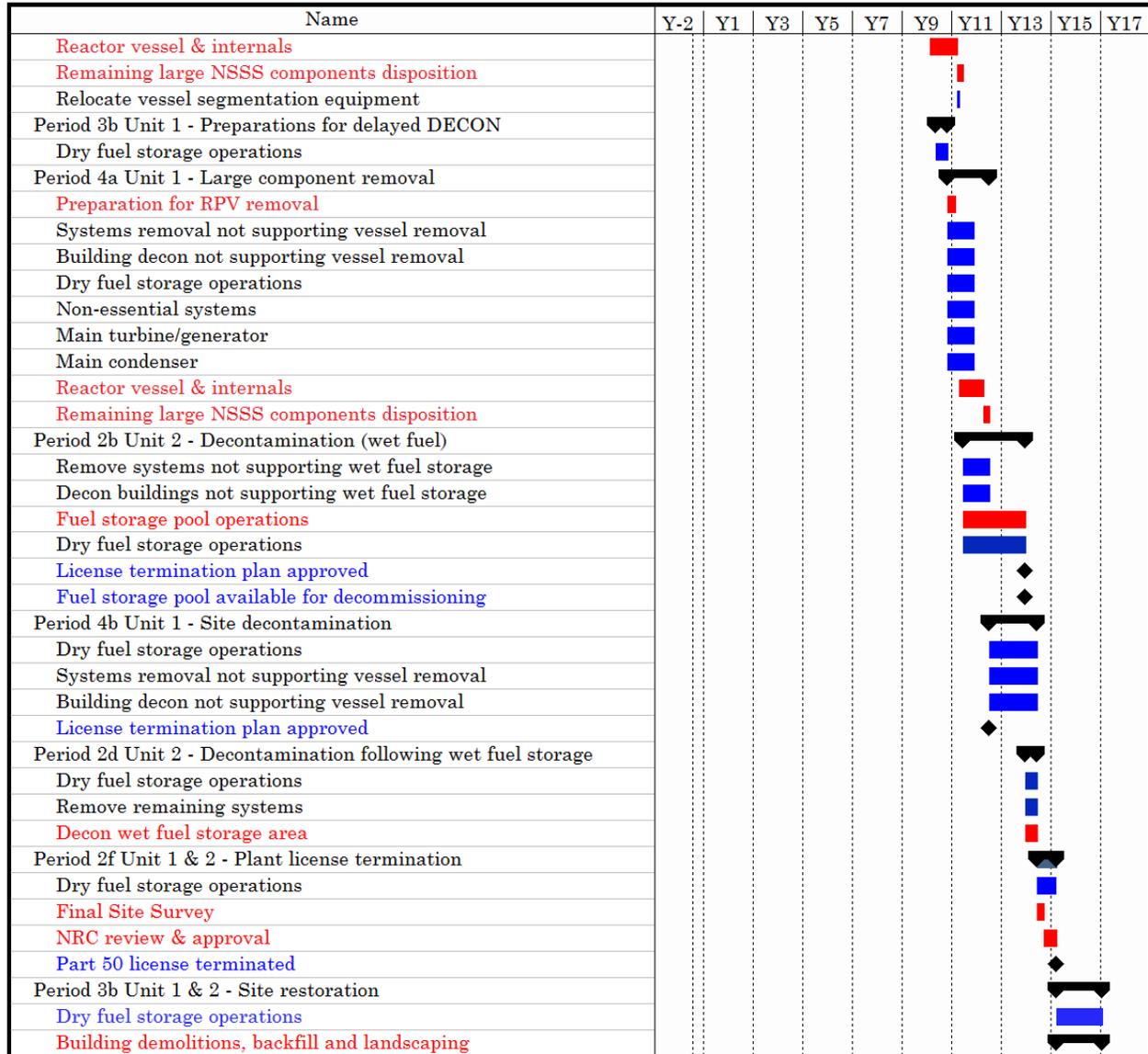
The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedule for decommissioning. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs. A second critical path is shown for the spent fuel storage period, which determines the release of the fuel handling building for final decontamination.

Project timelines are provided in Figures 4.2 and 4.3, with milestone dates based on the 2036 and 2043 shutdown dates for Units 1 and 2, respectively. The fuel pools are emptied approximately five and one half years after shutdown, while ISFSI operations continue until the DOE can complete the transfer of assemblies to its geologic repository. Deferred decommissioning in the SAFSTOR alternative is assumed to commence so that the operating license is terminated within a 60-year period from the cessation of plant operations.

FIGURE 4.1  
ACTIVITY SCHEDULE



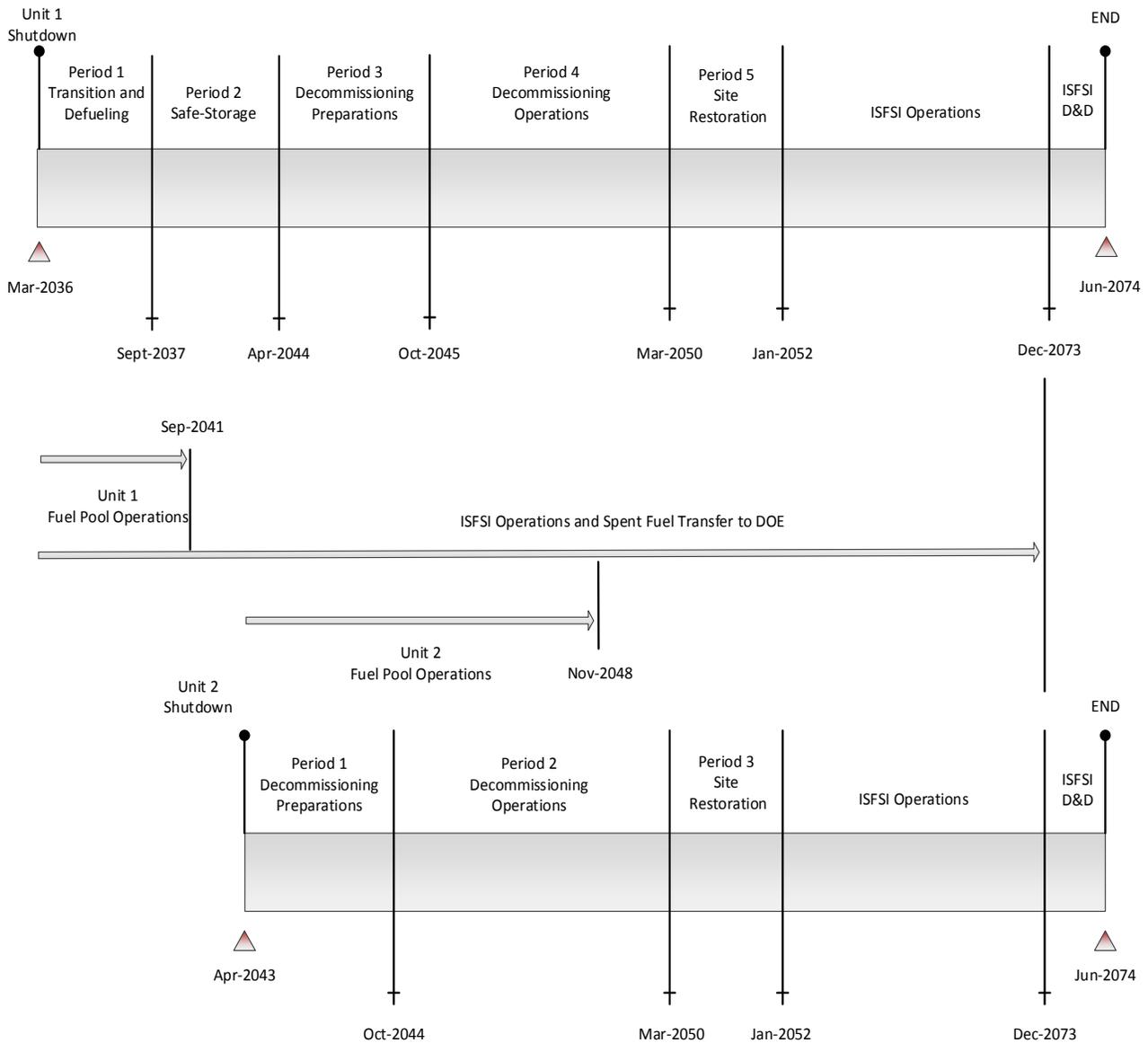
**FIGURE 4.1 (continued)  
ACTIVITY SCHEDULE**



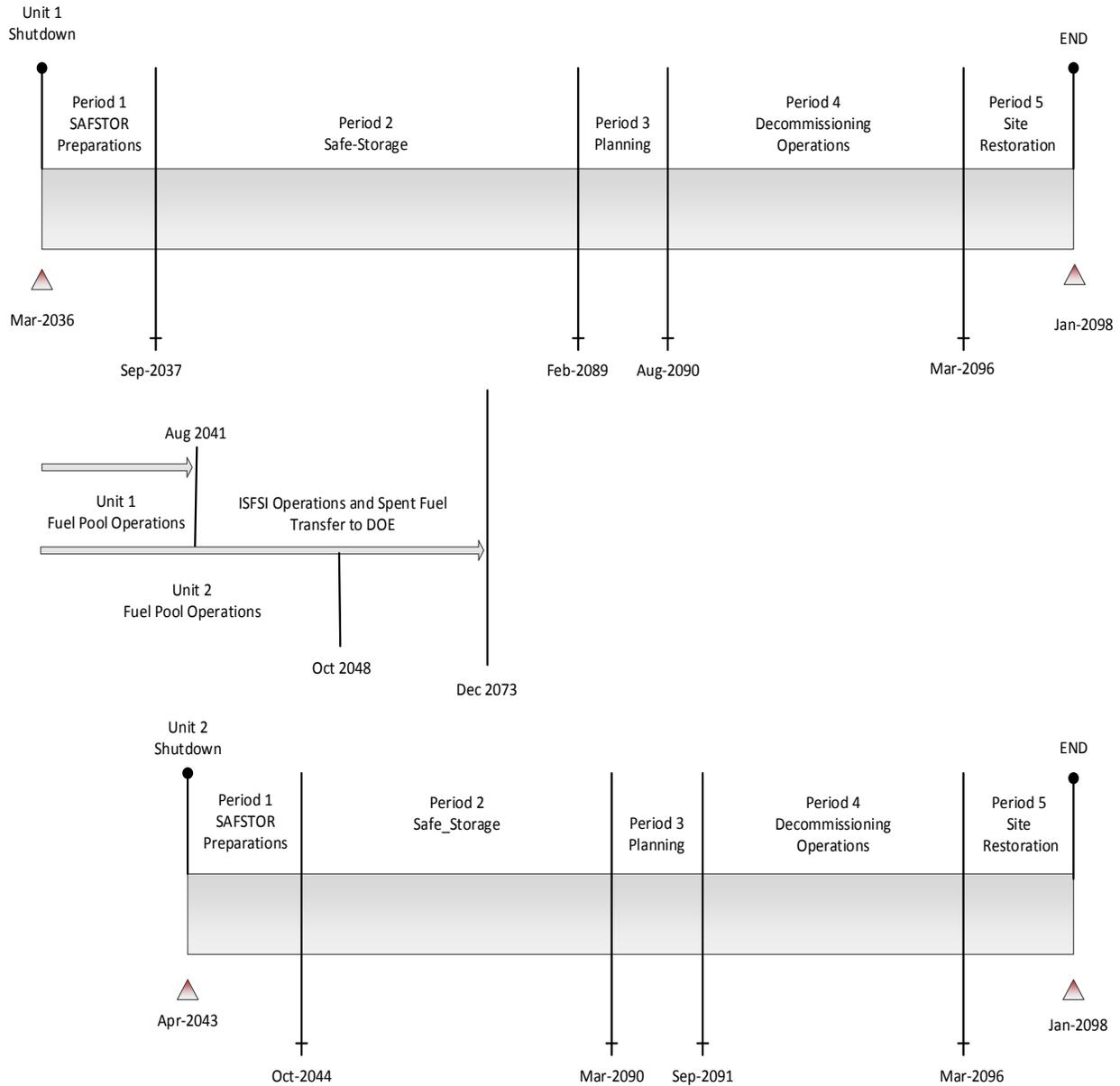
**LEGEND**

1. Red scheduling bars indicate critical path activities
2. Blue scheduling bars associated with major decommissioning periods, e.g., Period 1a, indicate overall duration of that period
3. Diamond symbols indicate major milestones

**FIGURE 4.2  
DECOMMISSIONING TIMELINE  
DECON  
(not to scale)**



**FIGURE 4.3  
DECOMMISSIONING TIMELINE  
SAFSTOR  
(not to scale)**



## **5. RADIOACTIVE WASTES**

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC license. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,<sup>[33]</sup> the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR Parts 173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in 10 CFR §173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The destinations for the various waste streams from decommissioning are identified in Figures 5.1 and 5.2. The volumes are shown on a line-item basis in Appendices C and D, and summarized in Tables 5.1 and 5.2. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

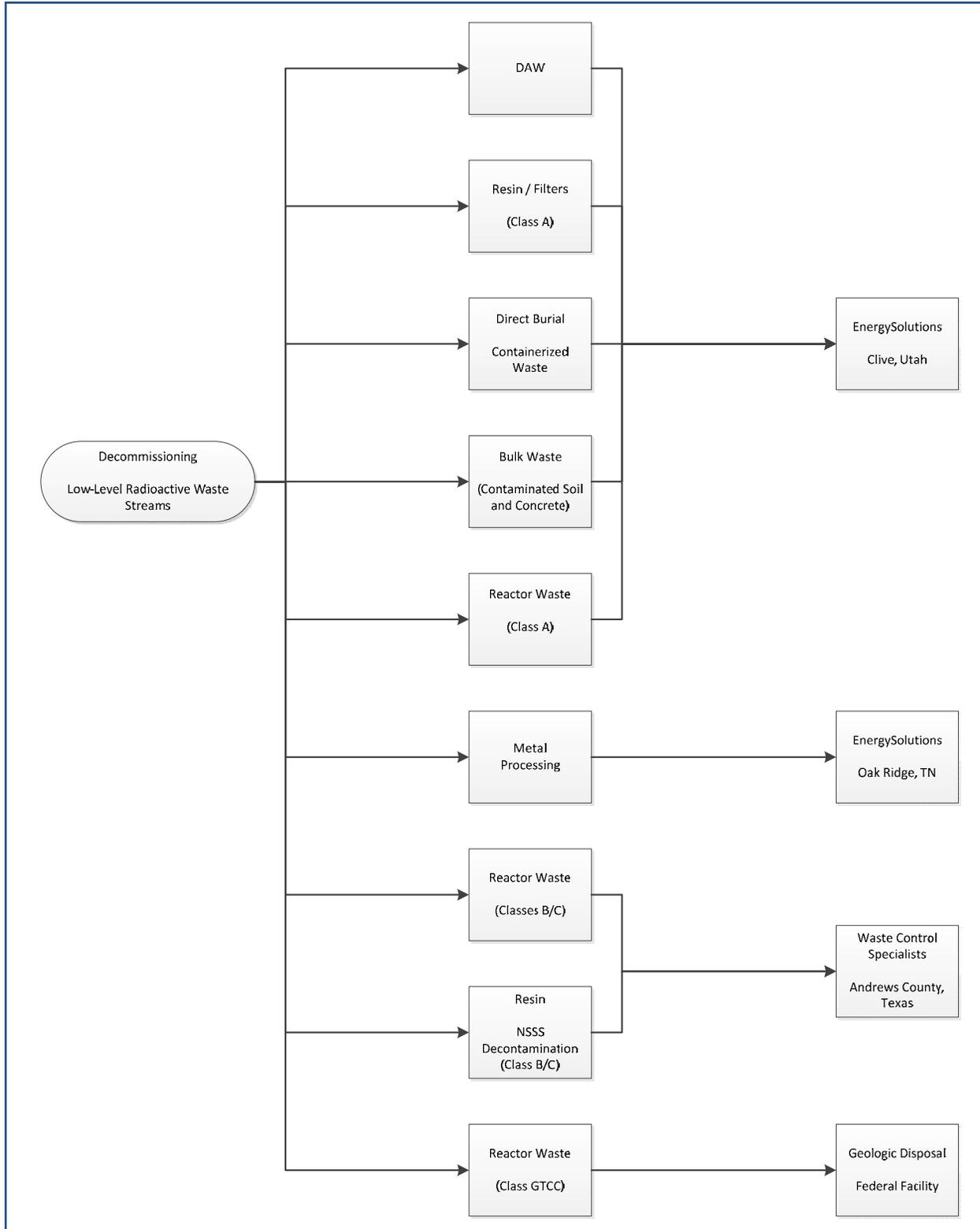
No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone (i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides). While the dose rates decrease with time, radionuclides such as <sup>137</sup>Cs will still control the disposition requirements.

The waste material produced in the decontamination and dismantling of the nuclear plants is primarily generated during Period 2 of DECON and Period 4 of SAFSTOR. Material that is considered potentially contaminated when removed from the radiological controlled area is sent to processing facilities in Tennessee for conditioning and disposal. Heavily contaminated components and activated materials are routed for controlled disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling.

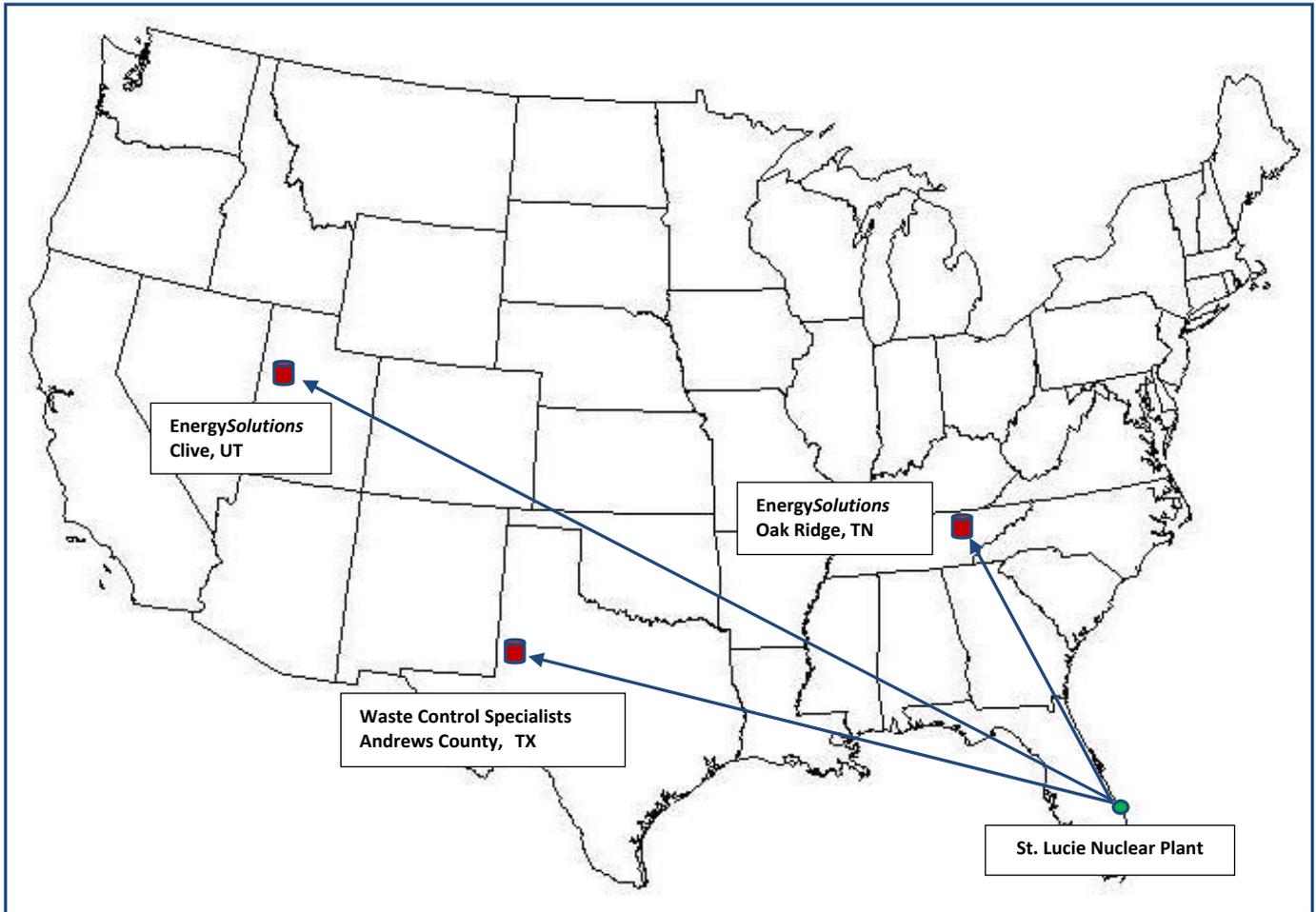
For purposes of constructing the estimates, FPL's current cost for disposal at the *EnergySolutions* facility was used for the majority of the radioactive waste produced from the decommissioning activities. Separate rates were used for containerized waste and large components, including the steam generators and reactor coolant pump motors. Demolition debris including miscellaneous steel, scaffolding, and concrete was disposed of at a bulk rate. The decommissioning waste stream also included resins and dry active waste.

Since *EnergySolutions* is not currently able to receive the more highly radioactive components generated in the decontamination and dismantling of the reactor, disposal costs for the Class B and C material were based upon published rates for the Andrews County disposal facility.

**FIGURE 5.1**  
**RADIOACTIVE WASTE DISPOSITION**



**FIGURE 5.2  
DECOMMISSIONING WASTE DESTINATIONS  
RADIOLOGICAL**



**TABLE 5.1  
DECON  
DECOMMISSIONING WASTE SUMMARY**

Waste Class	Waste Form	Cost Basis	Class <sup>[1]</sup>	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (at near-surface disposal facility)	Containerized and Bulk Debris	<i>EnergySolutions</i>	A	326,508	25,248,890
		WCS	B	1,982	231,746
		WCS	C	785	96,248
	Contaminated Soil	<i>EnergySolutions</i>	A	1,969,897	196,989,710
	Storm Drain Remediation	<i>EnergySolutions</i>	A	82,693	8,298,877
Greater than Class C (geologic repository)	Modified DSCs	Spent Fuel Equivalent	GTCC	5,772	1,134,577
Total <sup>[2]</sup>				2,387,638	232,000,048
Processed/Conditioned (at off-site recycling center)		Recycling Vendors	A	332,863	13,433,153

<sup>[1]</sup> Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

<sup>[2]</sup> Columns may not add due to rounding.

**TABLE 5.2  
SAFSTOR  
DECOMMISSIONING WASTE SUMMARY**

Waste Class	Waste Form	Cost Basis	Class <sup>[1]</sup>	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (at near-surface disposal facility)	Containerized and Bulk Debris	<i>EnergySolutions</i>	A	302,747	23,187,166
		WCS	B	1,502	153,186
		WCS	C	785	96,248
	Contaminated Soil	<i>EnergySolutions</i>	A	1,969,897	196,989,710
	Storm Drain Remediation	<i>EnergySolutions</i>	A	82,693	8,298,877
Greater than Class C (geologic repository)	Modified DSCs	Spent Fuel Equivalent	GTCC	5,772	1,134,577
Total <sup>[2]</sup>				2,363,396	229,859,764
Processed/Conditioned (at off-site recycling center)		Recycling Vendors	A	323,981	13,102,137

<sup>[1]</sup> Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

<sup>[2]</sup> Columns may not add due to rounding.

## **6. RESULTS**

The analysis to estimate the costs to decommission St. Lucie relied upon the site-specific, technical information developed for a previous analysis prepared in 2010. While not an engineering study, the estimates provide the owner with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear plant

The estimates described in this report are based on numerous fundamental assumptions, including a 60-year operating life, regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenarios assume continued operation of the plant's spent fuel pools for a minimum of five and one half years following the cessation of operations for continued cooling of the assemblies.

The cost projected to promptly decommission the plant, manage the spent fuel, and restore the site is estimated to be \$1,806.5 million. The majority of this cost (approximately 66.9%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 26.9% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 6.2% is for the demolition of the designated structures and limited restoration of the site.

The cost projected for deferred decommissioning (SAFSTOR) is estimated to be \$2,068.7 million. The majority of this cost (approximately 70.4%) is associated with placing the plant in storage, ongoing caretaking of the plant during dormancy, and the eventual physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 24.1% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 5.5% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 and 6.2, are either labor-related or associated with the management and disposition of the radioactive waste. Program management is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that FPL will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. The owner will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract

personnel will provide engineering services, e.g., for preparing the activity specifications, work procedures, activation, and structural analyses, under the direction of the owner. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating licenses are terminated, the staff is substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pools will remain operational for a minimum of five and one half years following the cessation of operations. The pools will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool area. Over the five and one half-year period, the spent fuel will be packaged into transportable canisters for loading into a DOE-provided transport cask or relocation to the ISFSI.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including plant equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, disposition of the majority of the low-level radioactive material requiring controlled disposal is at the *EnergySolutions'* facility. Highly activated components, requiring additional isolation from the environment (GTCC), are packaged for geologic disposal. The cost of geologic disposal is based upon a cost equivalent for spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary tables for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating license.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear plant.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining plant surface areas and surrounding environs, sampling, isotopic analysis, and documentation of the findings. The status of any plant components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs are greatly reduced following the final cessation of plant operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

**TABLE 6.1**  
**DECON**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Total	Percentage
Decontamination	28,048	1.6
Removal	215,703	11.9
Packaging	59,248	3.3
Transportation	46,466	2.6
Waste Disposal	178,181	9.9
Off-site Waste Processing	33,126	1.8
Program Management <sup>[1]</sup>	562,822	31.2
Site Security	181,472	10.0
Spent Fuel Pool Isolation	21,250	1.2
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	280,964	15.6
Insurance and Regulatory Fees	47,247	2.6
Energy	46,828	2.6
Characterization and Licensing Surveys	43,144	2.4
Property Taxes	10,493	0.6
Miscellaneous Equipment	16,783	0.9
Fixed Overhead	19,387	1.1
INPO, NEI Fees	10,187	0.6
Florida LLRW Inspection Fee	5,130	0.3
<b>Total <sup>[3]</sup></b>	<b>1,806,479</b>	<b>100.0</b>

Cost Element	Total	Percentage
License Termination	1,208,237	66.9
Spent Fuel Management <sup>[4]</sup>	486,705	26.9
Site Restoration	111,537	6.2
<b>Total <sup>[3]</sup></b>	<b>1,806,479</b>	<b>100.0</b>

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

**TABLE 6.2**  
**SAFSTOR**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Total	Percentage
Decontamination	22,851	1.1
Removal	214,245	10.4
Packaging	42,642	2.1
Transportation	39,333	1.9
Waste Disposal	159,175	7.7
Off-site Waste Processing	32,467	1.6
Program Management <sup>[1]</sup>	691,321	33.4
Site Security	253,276	12.2
Spent Fuel Pool Isolation	21,250	1.0
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	271,129	13.1
Insurance and Regulatory Fees	93,837	4.5
Energy	79,995	3.9
Characterization and Licensing Surveys	43,088	2.1
Property Taxes	12,359	0.6
Miscellaneous Equipment	36,331	1.8
Fixed Overhead	38,797	1.9
INPO,NEI Fees	11,449	0.6
Florida LLRW Inspection Fee	5,192	0.3
<b>Total <sup>[3]</sup></b>	<b>2,068,739</b>	<b>100.0</b>

Cost Element	Total	Percentage
License Termination	1,457,360	70.4
Spent Fuel Management <sup>[4]</sup>	498,209	24.1
Site Restoration	113,170	5.5
<b>Total <sup>[3]</sup></b>	<b>2,068,739</b>	<b>100.0</b>

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

## **7. REFERENCES**

1. “Decommissioning Cost Analysis for the St. Lucie Nuclear Plant, Units 1 and 2,” Document F02-1630-002, Rev. 0, TLG Services, Inc., December 2010
2. U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72, "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, 53 Fed. Reg. 24018, June 27, 1988
3. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," Rev. 2, October 2011
4. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, “Radiological Criteria for License Termination”
5. U.S. Code of Federal Regulations, Title 10, Parts 20 and 50, “Entombment Options for Power Reactors,” Advanced Notice of Proposed Rulemaking, 66 Fed. Reg. 52551, October 16, 2001
6. U.S. Code of Federal Regulations, Title 10, Parts 2, 50 and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, 61 Fed. Reg. 39278, July 29, 1996
7. U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70, and 72, "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, (p 35512 et seq.), June 17, 2011
8. Charter of the Blue Ribbon Commission on America’s Nuclear Future, “Objectives and Scope of Activities”
9. “Blue Ribbon Commission on America’s Nuclear Future, Report to the Secretary of Energy,” p. 32, January 2012
10. “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” U.S. DOE, January 11, 2013
11. U.S. Court of Appeals for the District Of Columbia Circuit, In Re: Aiken County, et al, Aug. 2013, [http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/\\$file/11-1271-1451347.pdf](http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/$file/11-1271-1451347.pdf)

## **7. REFERENCES**

(continued)

12. In 2008, the DOE issued a report to Congress in which it concluded that it did not have authority, under present law, to accept spent nuclear fuel for interim storage from decommissioned commercial nuclear power reactor sites. However, the Blue Ribbon Commission, in its final report, noted that: “[A]ccepting spent fuel according to the OFF [Oldest Fuel First] priority ranking instead of giving priority to shutdown reactor sites could greatly reduce the cost savings that could be achieved through consolidated storage if priority could be given to accepting spent fuel from shutdown reactor sites before accepting fuel from still-operating plants. .... The magnitude of the cost savings that could be achieved by giving priority to shutdown sites appears to be large enough (i.e., in the billions of dollars) to warrant DOE exercising its right under the Standard Contract to move this fuel first.” For planning purposes only, this estimate does not assume that St. Lucie, as a permanently shutdown plant, will receive priority; the fuel removal schedule assumed in this estimate is based upon DOE acceptance of fuel according to the “Oldest Fuel First” priority ranking. The plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance.
13. U.S. Code of Federal Regulations, Title 10, Part 50, “Domestic Licensing of Production and Utilization Facilities,” Subpart 54 (bb), “Conditions of Licenses”
14. “Low Level Radioactive Waste Policy Act,” Public Law 96-573, 1980
15. “Low-Level Radioactive Waste Policy Amendments Act of 1985,” Public Law 99-240, 1986
16. Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55
17. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, “Radiological Criteria for License Termination,” 62 Fed. Reg. 39058, July 21, 1997
18. “Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination,” EPA Memorandum OSWER No. 9200.4-18, August 22, 1997
19. U.S. Code of Federal Regulations, Title 40, Part 141.16, “Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in community water systems”

## **7. REFERENCES**

(continued)

20. "Memorandum of Understanding Between the Environmental Protection Agency and the Nuclear Regulatory Commission: Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites," OSWER 9295.8-06a, October 9, 2002
21. "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," NUREG/CR-1575, Rev. 1, EPA 402-R-97-016, Rev. 1, August 2000
22. T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986
23. W.J. Manion and T.S. LaGuardia, "Decommissioning Handbook," U.S. Department of Energy, DOE/EV/10128-1, November 1980
24. "Building Construction Cost Data 2015," Robert Snow Means Company, Inc., Kingston, Massachusetts
25. Project and Cost Engineers' Handbook, Second Edition, p. 239, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, 1984
26. U.S. Department of Transportation, Title 49 of the Code of Federal Regulations, "Transportation," Parts 173 through 178
27. Tri-State Motor Transit Company, published tariffs
28. J.C. Evans et al., "Long-Lived Activation Products in Reactor Materials" NUREG/CR-3474, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, August 1984
29. R.I. Smith, G.J. Konzek, W.E. Kennedy, Jr., "Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station," NUREG/CR-0130 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, June 1978
30. H.D. Oak, et al., "Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station," NUREG/CR-0672 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, June 1980

## **7. REFERENCES**

(continued)

31. SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," June 2000
32. "Microsoft Project Professional 2010," Microsoft Corporation, Redmond, WA.
33. "Atomic Energy Act of 1954," (68 Stat. 919)

**APPENDIX A**  
**UNIT COST FACTOR DEVELOPMENT**

**APPENDIX A**  
**UNIT COST FACTOR DEVELOPMENT**

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

**1. SCOPE**

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

**2. CALCULATIONS**

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
-----			
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	<u>60</u>	<u>60</u>
Totals (Activity/Critical)		355	255
Duration adjustment(s):			
+ Respiratory protection adjustment (50% of critical duration)			128
+ Radiation/ALARA adjustment (37% of critical duration)			<u>95</u>
Adjusted work duration			478
+ Protective clothing adjustment (30% of adjusted duration)			<u>143</u>
Productive work duration			621
+ Work break adjustment (8.33 % of productive duration)			<u>52</u>
Total work duration (minutes)			673

**\*\*\* Total duration = 11.217 hr \*\*\***

\* alpha designators indicate activities that can be performed in parallel

**APPENDIX A**  
(continued)

**3. LABOR REQUIRED**

Crew	Number	Duration (hours)	Rate (\$/hr)	Cost
Laborers	3.00	11.217	\$33.37	\$1,122.93
Craftsmen	2.00	11.217	\$51.44	\$1,154.00
Foreman	1.00	11.217	\$55.73	\$625.12
General Foreman	0.25	11.217	\$58.57	\$164.24
Fire Watch	0.05	11.217	\$33.37	\$18.72
Health Physics Technician	1.00	11.217	\$52.90	<u>\$593.38</u>
Total Labor Cost				\$3,678.39

**4. EQUIPMENT & CONSUMABLES COSTS**

Equipment Costs	none
Consumables/Materials Costs	
-Universal sorbent 50 @ \$0.59 sq ft <sup>{1}</sup>	\$29.50
-Tarpaulin, oil resistant/fire retardant) 50 @ \$0.36/sq ft <sup>{2}</sup>	\$18.00
-Gas torch consumables 1 @ \$17.71/hr x 1 hr <sup>{3}</sup>	<u>\$17.71</u>
Subtotal cost of equipment and materials	\$65.21
Overhead & profit on equipment and materials @ 16.50 %	<u>\$10.76</u>
Total costs, equipment & material	\$75.97

**TOTAL COST:**

<b>Removal of contaminated heat exchanger &lt;3000 pounds:</b>	<b>\$3,754.36</b>
Total labor cost:	\$3,678.39
Total equipment/material costs:	\$75.97
Total craft labor man-hours required per unit:	81.88

## **5. NOTES AND REFERENCES**

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.
- References for equipment & consumables costs:
  1. [www.mcmaster.com](http://www.mcmaster.com) online catalog, McMaster Carr Spill Control (7193T88)
  2. R.S. Means (2015) Division 01 56, Section 13.60-0600, page 22
  3. R.S. Means (2015) Division 01 54 33, Section 40-6360, page 706
- Material and consumable costs were adjusted using the regional indices for West Palm Beach, Florida.

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(DECON: Power Block Structures Only)**

## APPENDIX B

### UNIT COST FACTOR LISTING (Power Block Structures Only)

Unit Cost Factor	Cost/Unit(\$)
Removal of clean instrument and sampling tubing, \$/linear foot	0.39
Removal of clean pipe 0.25 to 2 inches diameter, \$/linear foot	4.08
Removal of clean pipe >2 to 4 inches diameter, \$/linear foot	5.98
Removal of clean pipe >4 to 8 inches diameter, \$/linear foot	12.03
Removal of clean pipe >8 to 14 inches diameter, \$/linear foot	22.78
Removal of clean pipe >14 to 20 inches diameter, \$/linear foot	29.72
Removal of clean pipe >20 to 36 inches diameter, \$/linear foot	43.70
Removal of clean pipe >36 inches diameter, \$/linear foot	51.88
Removal of clean valve >2 to 4 inches	79.73
Removal of clean valve >4 to 8 inches	120.30
Removal of clean valve >8 to 14 inches	227.80
Removal of clean valve >14 to 20 inches	297.19
Removal of clean valve >20 to 36 inches	437.00
Removal of clean valve >36 inches	518.76
Removal of clean pipe hanger for small bore piping	27.95
Removal of clean pipe hanger for large bore piping	94.86
Removal of clean pump, <300 pound	205.03
Removal of clean pump, 300-1000 pound	574.74
Removal of clean pump, 1000-10,000 pound	2,245.53
Removal of clean pump, >10,000 pound	4,350.11
Removal of clean pump motor, 300-1000 pound	239.01
Removal of clean pump motor, 1000-10,000 pound	931.25
Removal of clean pump motor, >10,000 pound	2,095.31
Removal of clean heat exchanger <3000 pound	1,212.35
Removal of clean heat exchanger >3000 pound	3,061.93
Removal of clean feedwater heater/deaerator	8,585.33
Removal of clean moisture separator/reheater	17,588.98
Removal of clean tank, <300 gallons	263.48
Removal of clean tank, 300-3000 gallon	826.82
Removal of clean tank, >3000 gallons, \$/square foot surface area	7.08

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of clean electrical equipment, <300 pound	109.96
Removal of clean electrical equipment, 300-1000 pound	389.13
Removal of clean electrical equipment, 1000-10,000 pound	778.26
Removal of clean electrical equipment, >10,000 pound	1,871.93
Removal of clean electrical transformer < 30 tons	1,300.04
Removal of clean electrical transformer > 30 tons	3,743.88
Removal of clean standby diesel generator, <100 kW	1,327.88
Removal of clean standby diesel generator, 100 kW to 1 MW	2,963.91
Removal of clean standby diesel generator, >1 MW	6,135.88
Removal of clean electrical cable tray, \$/linear foot	10.42
Removal of clean electrical conduit, \$/linear foot	4.56
Removal of clean mechanical equipment, <300 pound	109.96
Removal of clean mechanical equipment, 300-1000 pound	389.13
Removal of clean mechanical equipment, 1000-10,000 pound	778.26
Removal of clean mechanical equipment, >10,000 pound	1,871.93
Removal of clean HVAC equipment, <300 pound	132.97
Removal of clean HVAC equipment, 300-1000 pound	467.58
Removal of clean HVAC equipment, 1000-10,000 pound	931.87
Removal of clean HVAC equipment, >10,000 pound	1,871.93
Removal of clean HVAC ductwork, \$/pound	0.41
Removal of contaminated instrument and sampling tubing, \$/linear foot	1.33
Removal of contaminated pipe 0.25 to 2 inches diameter, \$/linear foot	19.09
Removal of contaminated pipe >2 to 4 inches diameter, \$/linear foot	32.07
Removal of contaminated pipe >4 to 8 inches diameter, \$/linear foot	52.11
Removal of contaminated pipe >8 to 14 inches diameter, \$/linear foot	99.72
Removal of contaminated pipe >14 to 20 inches diameter, \$/linear foot	119.37
Removal of contaminated pipe >20 to 36 inches diameter, \$/linear foot	164.19
Removal of contaminated pipe >36 inches diameter, \$/linear foot	193.53
Removal of contaminated valve >2 to 4 inches	392.91
Removal of contaminated valve >4 to 8 inches	469.26

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of contaminated valve >8 to 14 inches	941.91
Removal of contaminated valve >14 to 20 inches	1,194.64
Removal of contaminated valve >20 to 36 inches	1,586.53
Removal of contaminated valve >36 inches	1,879.97
Removal of contaminated pipe hanger for small bore piping	127.88
Removal of contaminated pipe hanger for large bore piping	406.48
Removal of contaminated pump, <300 pound	840.18
Removal of contaminated pump, 300-1000 pound	1,944.46
Removal of contaminated pump, 1000-10,000 pound	6,143.71
Removal of contaminated pump, >10,000 pound	14,963.22
Removal of contaminated pump motor, 300-1000 pound	840.76
Removal of contaminated pump motor, 1000-10,000 pound	2,515.46
Removal of contaminated pump motor, >10,000 pound	5,647.63
Removal of contaminated heat exchanger <3000 pound	3,754.36
Removal of contaminated heat exchanger >3000 pound	10,930.30
Removal of contaminated tank, <300 gallons	1,399.80
Removal of contaminated tank, >300 gallons, \$/square foot	27.04
Removal of contaminated electrical equipment, <300 pound	643.10
Removal of contaminated electrical equipment, 300-1000 pound	1,570.92
Removal of contaminated electrical equipment, 1000-10,000 pound	3,026.11
Removal of contaminated electrical equipment, >10,000 pound	5,970.01
Removal of contaminated electrical cable tray, \$/linear foot	31.12
Removal of contaminated electrical conduit, \$/linear foot	15.43
Removal of contaminated mechanical equipment, <300 pound	715.30
Removal of contaminated mechanical equipment, 300-1000 pound	1,734.29
Removal of contaminated mechanical equipment, 1000-10,000 pound	3,335.36
Removal of contaminated mechanical equipment, >10,000 pound	5,970.01
Removal of contaminated HVAC equipment, <300 pound	715.30
Removal of contaminated HVAC equipment, 300-1000 pound	1,734.29
Removal of contaminated HVAC equipment, 1000-10,000 pound	3,335.36

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of contaminated HVAC equipment, >10,000 pound	5,970.01
Removal of contaminated HVAC ductwork, \$/pound	1.94
Removal/plasma arc cut of contaminated thin metal components, \$/linear in.	3.40
Additional decontamination of surface by washing, \$/square foot	6.94
Additional decontamination of surfaces by hydrolasing, \$/square foot	32.06
Decontamination rig hook up and flush, \$/ 250 foot length	6,019.46
Chemical flush of components/systems, \$/gallon	18.85
Removal of clean standard reinforced concrete, \$/cubic yard	128.26
Removal of grade slab concrete, \$/cubic yard	166.34
Removal of clean concrete floors, \$/cubic yard	341.28
Removal of sections of clean concrete floors, \$/cubic yard	998.77
Removal of clean heavily rein concrete w/#9 rebar, \$/cubic yard	222.80
Removal of contaminated heavily rein concrete w/#9 rebar, \$/cubic yard	1,950.96
Removal of clean heavily rein concrete w/#18 rebar, \$/cubic yard	281.77
Removal of contaminated heavily rein concrete w/#18 rebar, \$/cubic yard	2,579.93
Removal heavily rein concrete w/#18 rebar & steel embedments, \$/cubic yard	415.15
Removal of below-grade suspended floors, \$/cubic yard	341.28
Removal of clean monolithic concrete structures, \$/cubic yard	822.83
Removal of contaminated monolithic concrete structures, \$/cubic yard	1,939.41
Removal of clean foundation concrete, \$/cubic yard	648.85
Removal of contaminated foundation concrete, \$/cubic yard	1,807.44
Explosive demolition of bulk concrete, \$/cubic yard	29.05
Removal of clean hollow masonry block wall, \$/cubic yard	23.97
Removal of contaminated hollow masonry block wall, \$/cubic yard	62.91
Removal of clean solid masonry block wall, \$/cubic yard	23.97
Removal of contaminated solid masonry block wall, \$/cubic yard	62.91
Backfill of below-grade voids, \$/cubic yard	31.26
Removal of subterranean tunnels/voids, \$/linear foot	101.76
Placement of concrete for below-grade voids, \$/cubic yard	121.87
Excavation of clean material, \$/cubic yard	3.02

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Excavation of contaminated material, \$/cubic yard	39.99
Removal of clean concrete rubble (tipping fee included), \$/cubic yard	23.71
Removal of contaminated concrete rubble, \$/cubic yard	25.50
Removal of building by volume, \$/cubic foot	0.29
Removal of clean building metal siding, \$/square foot	1.11
Removal of contaminated building metal siding, \$/square foot	3.99
Removal of standard asphalt roofing, \$/square foot	1.83
Removal of transite panels, \$/square foot	1.87
Scarifying contaminated concrete surfaces (drill & spall), \$/square foot	11.66
Scabbling contaminated concrete floors, \$/square foot	6.92
Scabbling contaminated concrete walls, \$/square foot	18.17
Scabbling contaminated ceilings, \$/square foot	62.24
Scabbling structural steel, \$/square foot	5.67
Removal of clean overhead crane/monorail < 10 ton capacity	557.16
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,637.65
Removal of clean overhead crane/monorail >10-50 ton capacity	1,337.21
Removal of contaminated overhead crane/monorail >10-50 ton capacity	3,929.70
Removal of polar crane > 50 ton capacity	5,640.79
Removal of gantry crane > 50 ton capacity	23,399.26
Removal of structural steel, \$/pound	0.18
Removal of clean steel floor grating, \$/square foot	4.27
Removal of contaminated steel floor grating, \$/square foot	12.61
Removal of clean free standing steel liner, \$/square foot	10.62
Removal of contaminated free standing steel liner, \$/square foot	31.55
Removal of clean concrete-anchored steel liner, \$/square foot	5.31
Removal of contaminated concrete-anchored steel liner, \$/square foot	36.79
Placement of scaffolding in clean areas, \$/square foot	14.26
Placement of scaffolding in contaminated areas, \$/square foot	23.19
Landscaping with topsoil, \$/acre	22,544.05
Cost of CPC B-88 LSA box & preparation for use	1,931.53

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Cost of CPC B-25 LSA box & preparation for use	1,766.49
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,432.82
Cost of CPC B-144 LSA box & preparation for use	9,892.75
Cost of LSA drum & preparation for use	183.31
Cost of cask liner for CNSI 8 120A cask (resins)	11,641.04
Cost of cask liner for CNSI 8 120A cask (filters)	8,316.38
Decontamination of surfaces with vacuuming, \$/square foot	0.71

**APPENDIX C  
DETAILED COST ANALYSIS  
DECON**

**Tables**

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C-2	St. Lucie Nuclear Plant, Unit 2.....	14

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 1a - Shutdown through Transition</b>																						
Period 1a Direct Decommissioning Activities																						
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	408	122	530	530	-	-	-	-	-	-	-	-	-	-	
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556	
1a.1.3	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.4	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.5	Notification of Permanent Defueling	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.6	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	102	15	118	118	-	-	-	-	-	-	-	-	-	855	
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	556	
1a.1.9	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428	
1a.1.11	End product description	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428	
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	77	11	88	88	-	-	-	-	-	-	-	-	-	641	
1a.1.13	Define major work sequence	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428	
1a.1.14	Perform SER and EA	-	-	-	-	-	-	158	24	182	182	-	-	-	-	-	-	-	-	-	1,326	
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	256	38	294	294	-	-	-	-	-	-	-	-	-	2,138	
Activity Specifications																						
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	251	38	289	289	-	-	-	-	-	-	-	-	-	2,104	
1a.1.16.2	Plant systems	-	-	-	-	-	-	213	32	245	245	-	-	-	-	-	-	-	-	-	1,782	
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	159	24	183	183	-	-	-	-	-	-	-	-	-	1,334	
1a.1.16.4	Waste management	-	-	-	-	-	-	102	15	118	118	-	-	-	-	-	-	-	-	-	855	
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	102	15	118	118	-	-	-	-	-	-	-	-	-	855	
1a.1.16	Total	-	-	-	-	-	-	828	124	953	953	-	-	-	-	-	-	-	-	-	6,930	
Detailed Work Procedures																						
1a.1.17.1	Plant systems	-	-	-	-	-	-	60	9	70	70	-	-	-	-	-	-	-	-	-	506	
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	61	9	71	71	-	-	-	-	-	-	-	-	-	513	
1a.1.17	Total	-	-	-	-	-	-	122	18	140	140	-	-	-	-	-	-	-	-	-	1,019	
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	43	
1a.1.19	Drain/de-energize non-cont. systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.20	Drain & dry NSSS	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.21	Drain/de-energize contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.22	Decon/secure contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	2,242	398	2,640	2,640	-	-	-	-	-	-	-	-	-	15,347	
Period 1a Collateral Costs																						
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,620	993	7,613	-	7,613	-	-	-	-	-	-	-	-	-	
1a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	
1a.3.3	Fixed Overhead	-	-	-	-	-	-	806	121	927	927	-	-	-	-	-	-	-	-	-	-	
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	7,426	1,114	8,540	928	7,613	-	-	-	-	-	-	-	-	-	
Period 1a Period-Dependent Costs																						
1a.4.1	Insurance	-	-	-	-	-	-	1,147	115	1,262	1,262	-	-	-	-	-	-	-	-	-	-	
1a.4.2	Property taxes	-	-	-	-	-	-	859	86	945	945	-	-	-	-	-	-	-	-	-	-	
1a.4.3	Health physics supplies	-	369	-	-	-	-	-	92	462	462	-	-	-	-	-	-	-	-	-	-	
1a.4.4	Heavy equipment rental	-	658	-	-	-	-	-	99	757	757	-	-	-	-	-	-	-	-	-	-	
1a.4.5	Disposal of DAW generated	-	-	10	3	-	35	-	10	58	58	-	-	-	493	-	-	-	-	9,854	16	
1a.4.6	Plant energy budget	-	-	-	-	-	-	3,003	451	3,454	3,454	-	-	-	-	-	-	-	-	-	-	
1a.4.7	NRC Fees	-	-	-	-	-	-	1,156	116	1,272	1,272	-	-	-	-	-	-	-	-	-	-	
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	667	67	734	-	734	-	-	-	-	-	-	-	-	-	
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	797	120	917	-	917	-	-	-	-	-	-	-	-	-	
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	-	
1a.4.11	INPO Fees	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	-	
1a.4.12	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-	
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,191	1,079	8,269	8,269	-	-	-	-	-	-	-	-	-	147,043	
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	31,064	4,660	35,724	35,724	-	-	-	-	-	-	-	-	-	423,400	
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,028	10	3	-	35	47,136	7,020	55,232	53,525	1,707	-	-	493	-	-	-	-	9,854	16	570,443
1a.0	TOTAL PERIOD 1a COST	-	1,028	10	3	-	35	56,805	8,532	66,412	57,093	9,320	-	-	493	-	-	-	-	9,854	16	585,789

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 1b - SAFSTOR Limited DECON Activities</b>																						
Period 1b Direct Decommissioning Activities																						
Decontamination of Site Buildings																						
1b.1.1.1	Reactor	1,061	-	-	-	-	-	-	530	1,591	1,591	-	-	-	-	-	-	-	-	-	22,339	-
1b.1.1.2	Reactor Auxiliary	485	-	-	-	-	-	-	243	728	728	-	-	-	-	-	-	-	-	-	10,511	-
1b.1.1.3	Fuel Handling	408	-	-	-	-	-	-	204	611	611	-	-	-	-	-	-	-	-	-	7,946	-
1b.1.1	Totals	1,953	-	-	-	-	-	-	977	2,930	2,930	-	-	-	-	-	-	-	-	-	40,796	-
1b.1	Subtotal Period 1b Activity Costs	1,953	-	-	-	-	-	-	977	2,930	2,930	-	-	-	-	-	-	-	-	-	40,796	-
Period 1b Collateral Costs																						
1b.3.1	Decon equipment	860	-	-	-	-	-	-	129	989	989	-	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	160	-	98	444	-	418	-	261	1,381	1,381	-	-	-	1,009	-	-	-	-	-	60,563	197
1b.3.4	Small tool allowance	-	29	-	-	-	-	-	4	34	34	-	-	-	-	-	-	-	-	-	-	-
1b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-	-
1b.3.6	Fixed Overhead	-	-	-	-	-	-	203	30	234	234	-	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,020	29	98	444	-	418	206	425	2,641	2,641	-	-	-	1,009	-	-	-	-	-	60,563	197
Period 1b Period-Dependent Costs																						
1b.4.1	Decon supplies	789	-	-	-	-	-	-	197	987	987	-	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	288	29	316	316	-	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	217	22	238	238	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	272	-	-	-	-	-	68	340	340	-	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	166	-	-	-	-	-	25	191	191	-	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	10	3	-	38	-	11	62	62	-	-	-	532	-	-	-	-	-	10,632	17
1b.4.7	Plant energy budget	-	-	-	-	-	-	757	114	871	871	-	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	173	17	190	190	-	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	168	17	185	-	185	-	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	201	30	231	-	231	-	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-	-
1b.4.12	NEI Fees	-	-	-	-	-	-	91	9	100	100	-	-	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,812	272	2,084	2,084	-	-	-	-	-	-	-	-	-	-	37,063
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,830	1,174	9,004	9,004	-	-	-	-	-	-	-	-	-	-	106,720
1b.4	Subtotal Period 1b Period-Dependent Costs	789	438	10	3	-	38	11,549	1,987	14,815	14,385	430	-	-	532	-	-	-	-	-	10,632	17
1b.0	TOTAL PERIOD 1b COST	3,762	468	108	447	-	456	11,755	3,388	20,385	19,955	430	-	-	1,541	-	-	-	-	-	71,195	41,010
<b>PERIOD 1c - Preparations for SAFSTOR Dormancy</b>																						
Period 1c Direct Decommissioning Activities																						
1c.1.1	Prepare support equipment for storage	-	435	-	-	-	-	-	65	501	501	-	-	-	-	-	-	-	-	-	-	3,000
1c.1.2	Install containment pressure equal. lines	-	36	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	-	-	700
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	-	-	13,040
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	4	34	34	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	30	4	34	34	-	-	-	-	-	-	-	-	-	-	249
1c.1	Subtotal Period 1c Activity Costs	-	471	-	-	-	-	763	295	1,529	1,529	-	-	-	-	-	-	-	-	-	-	16,740
Period 1c Additional Costs																						
1c.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,087	1,663	12,750	12,750	-	-	-	-	-	-	-	-	-	-	-
1c.2	Subtotal Period 1c Additional Costs	-	-	-	-	-	-	11,087	1,663	12,750	12,750	-	-	-	-	-	-	-	-	-	-	-
Period 1c Collateral Costs																						
1c.3.1	Process decommissioning water waste	194	-	119	541	-	510	-	318	1,683	1,683	-	-	-	1,231	-	-	-	-	-	73,846	240
1c.3.3	Small tool allowance	-	3	-	-	-	-	-	0	4	4	-	-	-	-	-	-	-	-	-	-	-
1c.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-	-
1c.3.5	Fixed Overhead	-	-	-	-	-	-	203	30	234	234	-	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	194	3	119	541	-	510	206	349	1,923	1,923	-	-	-	1,231	-	-	-	-	-	73,846	240

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	288	29	316	316	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	217	22	238	238	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	167	-	-	-	-	-	42	209	209	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	166	-	-	-	-	-	25	191	191	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	2	1	-	9	-	3	15	15	-	-	-	124	-	-	-	2,484	4	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	757	114	871	871	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	173	17	190	190	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	168	17	185	-	185	-	-	-	-	-	-	-	-	-
1c.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	201	30	231	-	231	-	-	-	-	-	-	-	-	-
1c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-
1c.4.11	NEI Fees	-	-	-	-	-	-	91	9	100	100	-	-	-	-	-	-	-	-	-	-
1c.4.12	Security Staff Cost	-	-	-	-	-	-	1,812	272	2,084	2,084	-	-	-	-	-	-	-	-	-	37,063
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	7,830	1,174	9,004	9,004	-	-	-	-	-	-	-	-	-	106,720
1c.4	Subtotal Period 1c Period-Dependent Costs	-	333	2	1	-	9	11,549	1,755	13,649	13,219	430	-	-	124	-	-	-	2,484	4	143,783
1c.0	TOTAL PERIOD 1c COST	194	808	122	542	-	519	23,604	4,062	29,851	29,421	430	-	-	1,355	-	-	-	76,329	16,984	144,032
<b>PERIOD 1 TOTALS</b>		<b>3,957</b>	<b>2,303</b>	<b>240</b>	<b>992</b>	<b>-</b>	<b>1,011</b>	<b>92,165</b>	<b>15,982</b>	<b>116,649</b>	<b>106,469</b>	<b>10,180</b>	<b>-</b>	<b>-</b>	<b>3,389</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>157,379</b>	<b>58,010</b>	<b>873,605</b>
<b>PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage</b>																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2a.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2a.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	4	1	5	5	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	560	140	700	700	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	564	141	705	705	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	53,715	8,057	61,772	-	61,772	-	-	-	-	-	-	-	-	-
2a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
2a.3.3	Fixed Overhead	-	-	-	-	-	-	3,225	484	3,709	3,709	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	56,942	8,541	65,483	3,711	61,772	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,728	173	1,901	-	1,901	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	3,440	344	3,783	3,783	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	553	-	-	-	-	-	138	691	691	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	13	4	-	49	-	14	81	81	-	-	687	-	-	-	-	13,744	22	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	2,404	361	2,765	-	2,765	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	1,200	120	1,320	1,320	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,835	183	2,018	-	2,018	-	-	-	-	-	-	-	-	-
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	3,192	479	3,670	-	3,670	-	-	-	-	-	-	-	-	-
2a.4.9	ISFSI Operating Costs	-	-	-	-	-	-	196	29	225	-	225	-	-	-	-	-	-	-	-	-
2a.4.10	NEI Fees	-	-	-	-	-	-	1,450	145	1,595	-	1,595	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	18,719	2,808	21,527	-	21,527	-	-	-	-	-	-	-	-	358,989
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	25,782	3,867	29,650	-	29,650	-	-	-	-	-	-	-	-	329,769
2a.4	Subtotal Period 2a Period-Dependent Costs	-	553	13	4	-	49	59,946	8,662	69,227	5,875	63,352	-	-	687	-	-	-	13,744	22	688,757
2a.0	TOTAL PERIOD 2a COST	-	553	13	4	-	49	117,452	17,343	135,414	10,291	125,124	-	-	687	-	-	-	13,744	22	688,757
<b>PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage</b>																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2b.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2b.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	368	92	460	460	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	371	92	463	463	-	-	-	-	-	-	-	-	-	-

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2b Collateral Costs																						
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	21,703	3,255	24,959	-	24,959	-	-	-	-	-	-	-	-	-	-
2b.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
2b.3.3	Fixed Overhead	-	-	-	-	-	-	2,119	318	2,437	2,437	-	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	23,823	3,573	27,396	2,438	24,959	-	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																						
2b.4.1	Insurance	-	-	-	-	-	-	1,109	111	1,220	-	1,220	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	2,015	202	2,217	-	2,217	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	151	-	-	-	-	-	38	188	188	-	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	3	1	-	13	-	4	21	21	-	-	-	176	-	-	-	-	3,517	6	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	790	118	908	-	908	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	736	74	809	809	-	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,206	121	1,326	-	1,326	-	-	-	-	-	-	-	-	-	-
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	129	19	148	-	148	-	-	-	-	-	-	-	-	-	-
2b.4.9	NEI Fees	-	-	-	-	-	-	953	95	1,048	-	1,048	-	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	8,085	1,213	9,297	-	9,297	-	-	-	-	-	-	-	-	-	170,057
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	1,469	220	1,689	-	1,689	-	-	-	-	-	-	-	-	-	21,943
2b.4	Subtotal Period 2b Period-Dependent Costs	-	151	3	1	-	13	16,491	2,214	18,873	1,018	17,855	-	-	176	-	-	-	-	3,517	6	192,000
2b.0	TOTAL PERIOD 2b COST	-	151	3	1	-	13	40,685	5,880	46,732	3,919	42,813	-	-	176	-	-	-	-	3,517	6	192,000
<b>PERIOD 2 TOTALS</b>		-	703	17	5	-	61	158,137	23,223	182,147	14,210	167,937	-	-	863	-	-	-	-	17,261	28	880,757
<b>PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy</b>																						
Period 3a Direct Decommissioning Activities																						
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-	1,967
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
3a.1.4	End product description	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	66	10	76	76	-	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	383	57	441	441	-	-	-	-	-	-	-	-	-	-	3,207
3a.1.7	Perform SER and EA	-	-	-	-	-	-	158	24	182	182	-	-	-	-	-	-	-	-	-	-	1,326
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	256	38	294	294	-	-	-	-	-	-	-	-	-	-	2,138
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	209	31	241	241	-	-	-	-	-	-	-	-	-	-	1,751
3a.1.10	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
Activity Specifications																						
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	377	56	433	390	-	43	-	-	-	-	-	-	-	-	3,151
3a.1.11.2	Plant systems	-	-	-	-	-	-	213	32	245	220	-	24	-	-	-	-	-	-	-	-	1,782
3a.1.11.3	Reactor internals	-	-	-	-	-	-	363	54	417	417	-	-	-	-	-	-	-	-	-	-	3,036
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	332	50	382	382	-	-	-	-	-	-	-	-	-	-	2,779
3a.1.11.5	Biological shield	-	-	-	-	-	-	26	4	29	29	-	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	159	24	183	183	-	-	-	-	-	-	-	-	-	-	1,334
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	82	12	94	47	-	47	-	-	-	-	-	-	-	-	684
3a.1.11.8	Main Turbine	-	-	-	-	-	-	20	3	24	-	-	24	-	-	-	-	-	-	-	-	171
3a.1.11.9	Main Condensers	-	-	-	-	-	-	20	3	24	-	-	24	-	-	-	-	-	-	-	-	171
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	159	24	183	92	-	92	-	-	-	-	-	-	-	-	1,334
3a.1.11.11	Waste management	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	-	1,967
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	46	7	53	26	-	26	-	-	-	-	-	-	-	-	385
3a.1.11	Total	-	-	-	-	-	-	2,033	305	2,338	2,058	-	280	-	-	-	-	-	-	-	-	17,009
Planning & Site Preparations																						
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	123	18	141	141	-	-	-	-	-	-	-	-	-	-	1,026
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	3,100	465	3,565	3,565	-	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	72	11	82	82	-	-	-	-	-	-	-	-	-	-	599
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-	526
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	9,116	1,367	10,483	10,203	-	280	-	-	-	-	-	-	-	-	31,088
Period 3a Collateral Costs																						
3a.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	-
3a.3.2	Fixed Overhead	-	-	-	-	-	-	806	121	927	927	-	-	-	-	-	-	-	-	-	-	-
3a.3	Subtotal Period 3a Collateral Costs	-	-	-	-	-	-	807	121	927	927	-	-	-	-	-	-	-	-	-	-	-

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	422	42	464	464	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	35	4	39	39	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	289	-	-	-	-	-	72	361	361	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	658	-	-	-	-	-	99	757	757	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	7	2	-	26	-	8	43	43	-	-	-	364	-	-	-	7,277	12	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	3,003	451	3,454	3,454	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	353	35	389	389	-	-	-	-	-	-	-	-	-	-
3a.4.8	Emergency Planning Fees	-	-	-	-	-	-	458	46	504	-	504	-	-	-	-	-	-	-	-	-
3a.4.9	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	-
3a.4.10	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-
3a.4.11	Security Staff Cost	-	-	-	-	-	-	1,428	214	1,642	1,642	-	-	-	-	-	-	-	-	-	37,814
3a.4.12	Utility Staff Cost	-	-	-	-	-	-	14,386	2,158	16,544	16,544	-	-	-	-	-	-	-	-	-	200,229
3a.4	Subtotal Period 3a Period-Dependent Costs	-	947	7	2	-	26	20,497	3,172	24,652	24,091	561	-	-	364	-	-	-	7,277	12	238,043
3a.0	TOTAL PERIOD 3a COST	-	947	7	2	-	26	30,419	4,660	36,062	35,221	561	280	-	364	-	-	-	7,277	12	269,130
<b>PERIOD 3b - Decommissioning Preparations</b>																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	242	36	278	250	-	28	-	-	-	-	-	-	-	2,024
3b.1.1.2	Reactor internals	-	-	-	-	-	-	128	19	147	147	-	-	-	-	-	-	-	-	-	1,069
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	69	10	79	20	-	60	-	-	-	-	-	-	-	577
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	186	28	213	213	-	-	-	-	-	-	-	-	-	1,552
3b.1.1.8	Facility closeout	-	-	-	-	-	-	61	9	71	35	-	35	-	-	-	-	-	-	-	513
3b.1.1.9	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	192
3b.1.1.10	Biological shield	-	-	-	-	-	-	61	9	71	71	-	-	-	-	-	-	-	-	-	513
3b.1.1.11	Steam generators	-	-	-	-	-	-	235	35	270	270	-	-	-	-	-	-	-	-	-	1,967
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	51	8	59	29	-	29	-	-	-	-	-	-	-	428
3b.1.1.13	Main Turbine	-	-	-	-	-	-	80	12	92	-	-	92	-	-	-	-	-	-	-	667
3b.1.1.14	Main Condensers	-	-	-	-	-	-	80	12	92	-	-	92	-	-	-	-	-	-	-	667
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	140	21	160	144	-	16	-	-	-	-	-	-	-	1,167
3b.1.1.16	Reactor building	-	-	-	-	-	-	140	21	160	144	-	16	-	-	-	-	-	-	-	1,167
3b.1.1	Total	-	-	-	-	-	-	1,648	247	1,895	1,528	-	367	-	-	-	-	-	-	-	13,787
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,648	247	1,895	1,528	-	367	-	-	-	-	-	-	-	13,787
Period 3b Additional Costs																					
3b.2.1	Asbestos Remediation	-	3,179	2	231	-	1,272	-	1,148	5,831	5,831	-	-	-	13,743	-	-	-	178,659	37,094	-
3b.2.2	Misc Hazardous Waste	-	-	665	169	5,164	-	-	866	6,863	6,863	-	-	27,017	-	-	-	-	1,397,259	5,520	-
3b.2.3	Site Characterization	-	-	-	-	-	-	2,455	736	3,191	3,191	-	-	-	-	-	-	-	-	13,042	4,640
3b.2	Subtotal Period 3b Additional Costs	-	3,179	667	400	5,164	1,272	2,455	2,750	15,886	15,886	-	-	27,017	13,743	-	-	-	1,575,918	55,656	4,640
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	860	-	-	-	-	-	-	129	989	989	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
3b.3.3	Small tool allowance	-	33	-	-	-	-	-	5	38	38	-	-	-	-	-	-	-	-	-	-
3b.3.4	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
3b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	27	3	30	30	-	-	-	-	-	-	-	-	-	-
3b.3.6	Fixed Overhead	-	-	-	-	-	-	400	60	460	460	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	860	1,233	-	-	-	-	1,615	555	4,263	4,263	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	26	-	-	-	-	-	-	7	33	33	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	209	21	230	230	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	18	2	19	19	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	345	-	-	-	-	-	86	431	431	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	326	-	-	-	-	-	49	375	375	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	4	1	-	15	-	4	24	24	-	-	205	-	-	-	-	4,098	7	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	1,489	223	1,713	1,713	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	175	18	193	193	-	-	-	-	-	-	-	-	-	-
3b.4.9	Emergency Planning Fees	-	-	-	-	-	-	227	23	250	-	250	-	-	-	-	-	-	-	-	-

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Period-Dependent Costs (continued)																					
3b.4.10	ISFSI Operating Costs	-	-	-	-	-	-	24	4	28	-	28	-	-	-	-	-	-	-	-	-
3b.4.11	NEI Fees	-	-	-	-	-	-	180	18	198	198	-	-	-	-	-	-	-	-	-	-
3b.4.12	Security Staff Cost	-	-	-	-	-	-	708	106	814	814	-	-	-	-	-	-	-	-	-	18,752
3b.4.13	DOC Staff Cost	-	-	-	-	-	-	3,439	516	3,955	3,955	-	-	-	-	-	-	-	-	-	42,406
3b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,134	1,070	8,204	8,204	-	-	-	-	-	-	-	-	-	99,291
3b.4	Subtotal Period 3b Period-Dependent Costs	26	671	4	1	-	15	13,603	2,146	16,467	16,189	278	-	-	205	-	-	-	4,098	7	160,449
3b.0	TOTAL PERIOD 3b COST	886	5,083	671	401	5,164	1,287	19,321	5,698	38,510	37,865	278	367	27,017	13,948	-	-	-	1,580,016	55,662	178,876
<b>PERIOD 3 TOTALS</b>		<b>886</b>	<b>6,030</b>	<b>678</b>	<b>403</b>	<b>5,164</b>	<b>1,313</b>	<b>49,741</b>	<b>10,358</b>	<b>74,572</b>	<b>73,086</b>	<b>839</b>	<b>647</b>	<b>27,017</b>	<b>14,312</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,587,293</b>	<b>55,674</b>	<b>448,006</b>
<b>PERIOD 4a - Large Component Removal</b>																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	12	45	9	18	-	201	-	71	358	358	-	-	-	495	-	-	-	56,538	1,227	-
4a.1.1.2	Pressurizer Relief Tank	1	5	2	3	-	31	-	10	52	52	-	-	-	78	-	-	-	8,699	142	-
4a.1.1.3	Reactor Coolant Pumps & Motors	34	77	60	147	-	2,140	-	599	3,058	3,058	-	-	-	6,541	-	-	-	564,000	3,039	80
4a.1.1.4	Pressurizer	8	51	357	104	-	1,098	-	343	1,961	1,961	-	-	-	3,358	-	-	-	238,456	1,508	750
4a.1.1.5	Steam Generators	39	3,338	1,600	3,867	1,633	4,706	-	3,015	18,198	18,198	-	-	30,926	14,387	-	-	-	2,498,110	10,254	2,250
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	32	260	275	103	-	648	-	286	1,604	1,604	-	-	-	4,243	-	-	-	182,094	6,114	-
4a.1.1.7	Reactor Vessel Internals	63	3,052	13,774	1,160	-	7,396	316	9,799	35,561	35,561	-	-	-	1,484	751	393	-	260,062	28,917	1,289
4a.1.1.8	Reactor Vessel	92	5,128	2,296	1,867	-	3,266	316	6,613	19,578	19,578	-	-	-	9,742	-	-	-	989,504	28,917	1,289
4a.1.1	Totals	281	11,957	18,372	7,270	1,633	19,487	632	20,737	80,369	80,369	-	-	30,926	40,328	751	393	-	4,797,462	80,117	5,657
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	302	199	164	400	1,067	-	447	2,580	2,580	-	-	5,144	4,536	-	-	-	531,281	6,395	-
4a.1.3	Main Condensers	-	935	228	188	459	1,222	-	659	3,690	3,690	-	-	5,890	5,193	-	-	-	608,323	20,075	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	1,378	-	-	-	-	-	207	1,585	1,585	-	-	-	-	-	-	-	-	-	19,868
4a.1.4.2	Reactor Auxiliary	-	198	-	-	-	-	-	30	228	228	-	-	-	-	-	-	-	-	-	2,515
4a.1.4.3	Fuel Handling	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	-	1,519
4a.1.4	Totals	-	1,691	-	-	-	-	-	254	1,944	1,944	-	-	-	-	-	-	-	-	-	23,903
Disposal of Plant Systems																					
4a.1.5.1	Air Evacuation	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	-	171
4a.1.5.2	Air Evacuation - Insulated	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	-	701
4a.1.5.3	Auxiliary Steam - Insulated	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	-	577
4a.1.5.4	Chemical & Volume Control	-	95	13	20	44	136	-	69	378	378	-	-	629	592	-	-	-	63,654	1,969	-
4a.1.5.5	Chemical & Volume Control - Insulated	-	403	52	56	5	445	-	226	1,187	1,187	-	-	67	1,885	-	-	-	127,813	7,484	-
4a.1.5.6	Chemical Feed	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	66
4a.1.5.7	Chemical Feed - Insulated	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	28
4a.1.5.8	Circulating & Intake Cooling Water	-	247	-	-	-	-	-	37	284	-	-	284	-	-	-	-	-	-	-	5,958
4a.1.5.9	Component Cooling	-	270	19	70	902	-	-	215	1,477	1,477	-	-	12,837	-	-	-	-	521,332	5,619	-
4a.1.5.10	Component Cooling - RCA	-	278	49	87	399	451	-	260	1,525	1,525	-	-	5,677	1,916	-	-	-	357,322	5,585	-
4a.1.5.11	Condensate	-	160	-	-	-	-	-	24	184	-	-	184	-	-	-	-	-	-	-	3,749
4a.1.5.12	Condensate - Insulated	-	90	-	-	-	-	-	14	104	-	-	104	-	-	-	-	-	-	-	2,214
4a.1.5.13	Condensate Polish Filter Demin	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	-	569
4a.1.5.14	Condensate Polish Filter Demin - Ins	-	72	-	-	-	-	-	11	83	-	-	83	-	-	-	-	-	-	-	1,778
4a.1.5.15	Condensate Recovery	-	3	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	-	86
4a.1.5.16	Condensate Recovery - Insulated	-	0	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	12
4a.1.5.17	Condensate Recovery - Insulated - RCA	-	1	0	0	0	1	-	0	2	-	-	-	1	2	-	-	-	209	11	-
4a.1.5.18	Condensate Recovery - RCA	-	11	1	1	9	6	-	6	34	34	-	-	131	26	-	-	-	7,011	210	-
4a.1.5.19	Condenser Tube Cleaning	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	-	838
4a.1.5.20	Demineralized Makeup Water	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	-	370
4a.1.5.21	Demineralized Makeup Water - RCA	-	12	2	2	2	12	-	7	37	37	-	-	32	52	-	-	-	4,768	210	-
4a.1.5.22	Domestic/Makeup/Service Water	-	183	-	-	-	-	-	27	210	-	-	210	-	-	-	-	-	-	-	4,067
4a.1.5.23	Domestic/Makeup/Service Water - RCA	-	91	10	15	41	92	-	55	304	304	-	-	583	391	-	-	-	49,597	1,713	-
4a.1.5.24	Domestic/Makeup/Service Water-Ins	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	-	93
4a.1.5.25	Domestic/Makeup/Service Water-Ins-RCA	-	11	1	2	4	10	-	6	35	35	-	-	63	44	-	-	-	5,486	206	-
4a.1.5.26	Electrical - Clean	-	2,035	-	-	-	-	-	305	2,340	-	-	2,340	-	-	-	-	-	-	-	46,406
4a.1.5.27	Extraction Steam	-	83	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	-	1,884
4a.1.5.28	Extraction Steam - Insulated	-	83	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	-	2,032

Table C-1  
St. Lucie Nuclear Plant, Unit 1  
Integrated DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
Disposal of Plant Systems (continued)																					
4a.1.5.29	Feedwater - Insulated	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,153	-
4a.1.5.30	Feedwater - Insulated - RCA	-	28	4	7	32	34	-	22	126	126	-	-	455	143	-	-	-	27,959	566	-
4a.1.5.31	Fire Protection	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,710	-
4a.1.5.32	Fire Protection - Insulated	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	163	-
4a.1.5.33	HVAC	-	74	-	-	-	-	-	11	85	-	-	85	-	-	-	-	-	-	1,898	-
4a.1.5.34	Heater Drain & Vent - Insulated	-	186	-	-	-	-	-	28	214	-	-	214	-	-	-	-	-	-	4,490	-
4a.1.5.35	Hydrogen Sampling	-	39	4	6	26	32	-	23	130	130	-	-	367	137	-	-	-	23,994	817	-
4a.1.5.36	Integrated Leak Rate Testing	-	27	2	4	13	22	-	15	83	83	-	-	179	93	-	-	-	13,407	532	-
4a.1.5.37	Main Steam - Insulated	-	193	-	-	-	-	-	29	222	-	-	222	-	-	-	-	-	-	4,624	-
4a.1.5.38	Main Steam - Insulated - RCA	-	41	6	10	48	50	-	32	188	188	-	-	688	214	-	-	-	42,107	812	-
4a.1.5.39	Misc Bulk Gas	-	17	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	440	-
4a.1.5.40	Misc Bulk Gas - RCA	-	13	2	2	2	13	-	7	38	38	-	-	23	53	-	-	-	4,467	231	-
4a.1.5.41	Miscellaneous	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	230	-
4a.1.5.42	Miscellaneous - RCA	-	9	2	5	26	21	-	12	75	75	-	-	365	90	-	-	-	20,772	190	-
4a.1.5.43	Neutralization Basin Recirculation	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	435	-
4a.1.5.44	Post Accident Sampling	-	14	1	2	8	8	-	7	41	41	-	-	117	36	-	-	-	7,143	311	-
4a.1.5.45	Post Accident Sampling - Insulated	-	40	2	2	2	18	-	15	79	79	-	-	22	76	-	-	-	5,929	858	-
4a.1.5.46	RCP Oil Collection	-	1	0	0	1	2	-	1	5	5	-	-	10	7	-	-	-	869	26	-
4a.1.5.47	SGBTF Blowdown - Insulated	-	25	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	642	-
4a.1.5.48	SGBTF HVAC	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,549	-
4a.1.5.49	SGBTF Misc - RCA	-	2	0	1	5	4	-	3	16	16	-	-	77	18	-	-	-	4,357	49	-
4a.1.5.50	SGBTF Waste Management	-	4	1	1	1	4	-	2	12	12	-	-	8	17	-	-	-	1,410	78	-
4a.1.5.51	SGBTF Waste Management - Insulated	-	42	5	5	5	37	-	22	115	115	-	-	72	155	-	-	-	13,208	742	-
4a.1.5.52	Safety Injection	-	181	67	99	254	637	-	264	1,501	1,501	-	-	3,611	2,714	-	-	-	325,534	3,853	-
4a.1.5.53	Safety Injection - Insulated	-	474	65	81	120	576	-	299	1,615	1,615	-	-	1,705	2,439	-	-	-	230,923	9,141	-
4a.1.5.54	Sampling	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	198	-
4a.1.5.55	Sampling - Insulated	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	188	-
4a.1.5.56	Sampling - Insulated - RCA	-	18	2	2	2	14	-	9	47	47	-	-	24	61	-	-	-	5,003	337	-
4a.1.5.57	Sampling - RCA	-	18	2	2	5	12	-	9	47	47	-	-	77	49	-	-	-	6,426	351	-
4a.1.5.58	Secondary Side Wet Layout	-	11	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	288	-
4a.1.5.59	Secondary Side Wet Layout - Ins	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	348	-
4a.1.5.60	Service & Instrument Air	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	617	-
4a.1.5.61	Service & Instrument Air - Ins	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	349	-
4a.1.5.62	Service & Instrument Air - Ins - RCA	-	64	7	7	9	53	-	32	172	172	-	-	122	225	-	-	-	19,881	1,186	-
4a.1.5.63	Service & Instrument Air - RCA	-	44	5	5	8	36	-	22	120	120	-	-	112	154	-	-	-	14,753	816	-
4a.1.5.64	Steam Gen Blowdown Cooling	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	372	-
4a.1.5.65	Steam Gen Blowdown Cooling - Ins - RCA	-	42	6	10	43	51	-	32	182	182	-	-	608	216	-	-	-	38,970	824	-
4a.1.5.66	Steam Gen Blowdown Cooling - Insulated	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	35	-
4a.1.5.67	Steam Gen Blowdown Cooling - RCA	-	56	8	13	58	71	-	43	248	248	-	-	825	300	-	-	-	53,317	1,077	-
4a.1.5.68	Steam Generator Blowdown	-	31	3	4	15	22	-	16	91	91	-	-	212	94	-	-	-	14,851	651	-
4a.1.5.69	Steam Generator Blowdown - Insulated	-	60	5	6	11	44	-	29	155	155	-	-	157	186	-	-	-	18,713	1,172	-
4a.1.5.70	Turbine	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	29	-
4a.1.5.71	Turbine Cooling Water	-	56	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	1,308	-
4a.1.5.72	Turbine Cooling Water - Insulated	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	854	-
4a.1.5.73	Turbine Lube Oil & Diesel Oil	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	1,596	-
4a.1.5.74	Water Treatment	-	69	-	-	-	-	-	10	80	-	-	80	-	-	-	-	-	-	1,622	-
4a.1.5.75	Water Treatment - Insulated	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	957	-
4a.1.5	Totals	-	6,632	343	526	2,098	2,914	-	2,393	14,907	10,063	-	4,843	29,859	12,387	-	-	-	2,031,185	146,321	-
4a.1.6	Scaffolding in support of decommissioning	-	633	13	5	48	13	-	171	884	884	-	-	618	54	-	-	-	31,415	15,869	-
4a.1	Subtotal Period 4a Activity Costs	281	22,150	19,156	8,154	4,638	24,703	632	24,661	104,374	99,530	-	4,843	72,437	62,498	751	393	-	7,999,665	292,680	5,657
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,871	561	2,432	2,432	-	-	-	-	-	-	-	-	35,365	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,871	561	2,432	2,432	-	-	-	-	-	-	-	-	35,365	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	36	-	25	114	-	108	-	65	348	348	-	-	-	260	-	-	-	15,622	51	-
4a.3.3	Small tool allowance	-	237	-	-	-	-	-	36	273	245	-	27	-	-	-	-	-	-	-	-
4a.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	132	13	146	146	-	-	-	-	-	-	-	-	-	-
4a.3.5	Fixed Overhead	-	-	-	-	-	-	1,371	206	1,577	1,577	-	-	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	36	237	25	114	-	108	1,503	319	2,343	2,316	-	27	-	260	-	-	-	15,622	51	-

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 4a Period-Dependent Costs																						
4a.4.1	Decon supplies	89	-	-	-	-	-	-	22	112	112	-	-	-	-	-	-	-	-	-	-	
4a.4.2	Insurance	-	-	-	-	-	-	718	72	790	790	-	-	-	-	-	-	-	-	-	-	
4a.4.3	Property taxes	-	-	-	-	-	-	60	6	66	60	-	7	-	-	-	-	-	-	-	-	
4a.4.4	Health physics supplies	-	2,048	-	-	-	-	-	512	2,560	2,560	-	-	-	-	-	-	-	-	-	-	
4a.4.5	Heavy equipment rental	-	4,038	-	-	-	-	-	606	4,644	4,644	-	-	-	-	-	-	-	-	-	-	
4a.4.6	Disposal of DAW generated	-	-	77	23	-	280	-	81	462	462	-	-	-	3,938	-	-	-	-	78,762	128	
4a.4.7	Plant energy budget	-	-	-	-	-	-	4,854	728	5,583	5,583	-	-	-	-	-	-	-	-	-	-	
4a.4.8	NRC Fees	-	-	-	-	-	-	1,024	102	1,126	1,126	-	-	-	-	-	-	-	-	-	-	
4a.4.9	Emergency Planning Fees	-	-	-	-	-	-	780	78	858	-	858	-	-	-	-	-	-	-	-	-	
4a.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	687	103	790	790	-	-	-	-	-	-	-	-	-	-	
4a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	83	12	96	-	96	-	-	-	-	-	-	-	-	-	
4a.4.12	NEI Fees	-	-	-	-	-	-	616	62	678	678	-	-	-	-	-	-	-	-	-	-	
4a.4.13	Security Staff Cost	-	-	-	-	-	-	2,748	412	3,161	3,161	-	-	-	-	-	-	-	-	-	74,520	
4a.4.14	DOC Staff Cost	-	-	-	-	-	-	20,549	3,082	23,631	23,631	-	-	-	-	-	-	-	-	-	243,893	
4a.4.15	Utility Staff Cost	-	-	-	-	-	-	32,706	4,906	37,612	37,612	-	-	-	-	-	-	-	-	-	437,255	
4a.4	Subtotal Period 4a Period-Dependent Costs	89	6,086	77	23	-	280	64,826	10,785	82,168	81,207	954	7	-	3,938	-	-	-	-	78,762	128	755,668
4a.0	TOTAL PERIOD 4a COST	406	28,473	19,258	8,292	4,638	25,092	68,832	36,327	191,316	185,486	954	4,877	72,437	66,696	751	393	-	-	8,094,049	328,225	761,326
<b>PERIOD 4b - Site Decontamination</b>																						
Period 4b Direct Decommissioning Activities																						
4b.1.1	Remove spent fuel racks	451	50	183	132	-	1,062	-	542	2,420	2,420	-	-	-	4,513	-	-	-	-	298,275	1,243	-
Disposal of Plant Systems																						
4b.1.2.1	Contnmnt Spray & Refueling Water	-	405	132	194	316	1,360	-	531	2,938	2,938	-	-	4,499	5,850	-	-	-	-	564,781	8,741	-
4b.1.2.2	Contnmnt Spray & Refueling Water - Ins	-	166	39	58	54	435	-	171	923	923	-	-	764	1,847	-	-	-	-	153,185	3,479	-
4b.1.2.3	Electrical - Contaminated	-	238	12	23	72	136	-	109	589	589	-	-	1,031	576	-	-	-	-	79,958	4,643	-
4b.1.2.4	Electrical - Decontaminated	-	1,644	113	202	646	1,215	-	853	4,674	4,674	-	-	9,189	5,165	-	-	-	-	714,614	30,800	-
4b.1.2.5	Emergency Diesel Generator	-	68	-	-	-	-	-	10	78	-	-	78	-	-	-	-	-	-	-	1,662	-
4b.1.2.6	Emergency Diesel Generator - Insulated	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	-	150	-
4b.1.2.7	Fire Protection - Insulated - RCA	-	2	0	0	1	1	-	1	6	6	-	-	17	6	-	-	-	-	1,130	38	-
4b.1.2.8	Fire Protection - RCA	-	23	2	4	16	18	-	13	76	76	-	-	228	78	-	-	-	-	14,402	455	-
4b.1.2.9	Fuel Pool	-	80	15	21	17	160	-	67	360	360	-	-	242	679	-	-	-	-	54,714	1,609	-
4b.1.2.10	Fuel Pool - Insulated	-	43	6	7	2	54	-	26	137	137	-	-	25	227	-	-	-	-	16,084	832	-
4b.1.2.11	HVAC - Contaminated	-	1,564	60	162	1,549	332	-	737	4,403	4,403	-	-	22,042	1,411	-	-	-	-	988,438	28,560	-
4b.1.2.12	Primary Water	-	146	24	39	83	257	-	121	670	670	-	-	1,185	1,122	-	-	-	-	120,385	3,100	-
4b.1.2.13	Primary Water - Insulated	-	3	0	0	0	2	-	1	7	7	-	-	1	11	-	-	-	-	739	51	-
4b.1.2.14	Radiation Monitoring	-	19	1	1	1	10	-	8	40	40	-	-	13	40	-	-	-	-	3,206	413	-
4b.1.2.15	Reactor Coolant - Insulated	-	70	8	9	7	66	-	37	196	196	-	-	100	279	-	-	-	-	22,609	1,487	-
4b.1.2.16	Refueling Equipment	-	108	10	18	48	116	-	67	367	367	-	-	689	493	-	-	-	-	60,584	2,357	-
4b.1.2.17	Secondary Side Wet Layup - Ins - RCA	-	12	1	2	2	12	-	7	36	36	-	-	29	50	-	-	-	-	4,504	209	-
4b.1.2.18	Secondary Side Wet Layup - RCA	-	12	1	2	9	9	-	7	41	41	-	-	130	39	-	-	-	-	7,843	224	-
4b.1.2.19	Waste Management	-	579	86	128	257	863	-	427	2,339	2,339	-	-	3,653	3,757	-	-	-	-	390,844	11,808	-
4b.1.2.20	Waste Management - Insulated	-	773	104	110	9	878	-	441	2,315	2,315	-	-	127	3,717	-	-	-	-	251,842	14,257	-
4b.1.2	Totals	-	5,959	614	979	3,089	5,925	-	3,635	20,201	20,116	-	85	43,965	25,350	-	-	-	-	3,449,862	114,874	-
4b.1.3	Scaffolding in support of decommissioning	-	950	20	8	72	19	-	256	1,325	1,325	-	-	927	82	-	-	-	-	47,122	23,804	-
Decontamination of Site Buildings																						
4b.1.4.1	Reactor	992	1,401	67	893	221	1,783	-	1,466	6,823	6,823	-	-	3,150	22,308	-	-	-	-	1,908,622	45,341	-
4b.1.4.2	Primary Water Tank Foundation - Contam	0	6	1	13	-	18	-	8	46	46	-	-	-	301	-	-	-	-	26,046	108	-
4b.1.4.3	Reactor Auxiliary	465	231	9	128	70	181	-	366	1,450	1,450	-	-	995	2,881	-	-	-	-	288,493	13,829	-
4b.1.4.4	Refueling Water Storage Tank - Contam	1	9	2	27	-	38	-	16	93	93	-	-	-	633	-	-	-	-	54,810	154	-
4b.1.4.5	Fuel Handling	370	396	5	26	117	38	-	316	1,268	1,268	-	-	1,664	442	-	-	-	-	104,278	15,528	-
4b.1.4	Totals	1,828	2,043	83	1,087	408	2,058	-	2,172	9,680	9,680	-	-	5,809	26,564	-	-	-	-	2,382,249	74,960	-
4b.1	Subtotal Period 4b Activity Costs	2,280	9,001	900	2,206	3,569	9,065	-	6,605	33,626	33,542	-	85	50,701	56,509	-	-	-	-	6,177,508	214,881	-
Period 4b Additional Costs																						
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,088	326	1,414	1,414	-	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,115	634	2,749	2,749	-	-	-	-	-	-	-	-	-	39,978	-
4b.2.3	Contaminated Soil Remediation	-	1,512	787	5,971	-	15,657	-	5,267	29,194	29,194	-	-	-	1,021,167	-	-	-	-	102,116,700	17,019	-
4b.2.4	Soil - Clean Closure	-	-	-	-	-	-	1,605	241	1,845	1,845	-	-	-	-	-	-	-	-	-	-	-
4b.2.5	Storm Drain Remediation	-	290	121	353	-	848	-	350	1,961	1,961	-	-	-	54,930	-	-	-	-	5,530,085	5,808	-

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
4b.2	Subtotal Period 4b Additional Costs	-	1,803	907	6,324	-	16,505	4,808	6,818	37,165	37,165	-	-	-	1,076,097	-	-	-	107,646,800	62,805	6,240
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	69	-	50	227	-	214	-	127	687	687	-	-	-	516	-	-	-	30,972	101	-
4b.3.3	Small tool allowance	-	177	-	-	-	-	-	27	204	204	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	129	60	467	124	-	123	903	903	-	-	6,000	529	-	-	-	304,968	88	-
4b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,357	204	1,560	-	1,560	-	-	-	-	-	-	-	-	-
4b.3.6	Florida LLRW Inspection Fee	-	-	-	-	-	-	2,218	222	2,440	2,440	-	-	-	-	-	-	-	-	-	-
4b.3.7	Fixed Overhead	-	-	-	-	-	-	1,550	232	1,782	1,782	-	-	-	-	-	-	-	-	-	-
4b.3	Subtotal Period 4b Collateral Costs	69	177	179	287	467	339	5,125	934	7,577	6,016	1,560	-	6,000	1,045	-	-	-	335,940	189	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	877	-	-	-	-	-	-	219	1,096	1,096	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	811	81	893	893	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	68	7	75	75	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,899	-	-	-	-	-	475	2,373	2,373	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	4,687	-	-	-	-	-	703	5,390	5,390	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	78	24	-	282	-	82	465	465	-	-	-	3,957	-	-	-	79,133	129	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	4,332	650	4,982	4,982	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,157	116	1,273	1,273	-	-	-	-	-	-	-	-	-	-
4b.4.9	Emergency Planning Fees	-	-	-	-	-	-	882	88	970	-	970	-	-	-	-	-	-	-	-	-
4b.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	776	116	893	893	-	-	-	-	-	-	-	-	-	-
4b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	94	14	108	-	108	-	-	-	-	-	-	-	-	-
4b.4.12	NEI Fees	-	-	-	-	-	-	697	70	767	767	-	-	-	-	-	-	-	-	-	-
4b.4.13	Security Staff Cost	-	-	-	-	-	-	3,107	466	3,573	3,573	-	-	-	-	-	-	-	-	-	84,240
4b.4.14	DOC Staff Cost	-	-	-	-	-	-	22,853	3,428	26,281	26,281	-	-	-	-	-	-	-	-	-	268,766
4b.4.15	Utility Staff Cost	-	-	-	-	-	-	35,807	5,371	41,178	41,178	-	-	-	-	-	-	-	-	-	473,349
4b.4	Subtotal Period 4b Period-Dependent Costs	877	6,586	78	24	-	282	70,585	11,886	90,316	89,238	1,078	-	-	3,957	-	-	-	79,133	129	826,354
4b.0	TOTAL PERIOD 4b COST	3,226	17,567	2,064	8,841	4,036	26,190	80,517	26,243	168,684	165,960	2,638	85	56,701	1,137,607	-	-	-	114,239,400	278,004	832,594
<b>PERIOD 4f - License Termination</b>																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	165	49	214	214	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	165	49	214	214	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	4,947	1,484	6,431	6,431	-	-	-	-	-	-	-	-	92,176	3,120
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	4,947	1,484	6,431	6,431	-	-	-	-	-	-	-	-	92,176	3,120
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
4f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,241	336	2,577	-	2,577	-	-	-	-	-	-	-	-	-
4f.3.3	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	-
4f.3.4	Fixed Overhead	-	-	-	-	-	-	607	91	698	698	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	4,037	606	4,643	2,066	2,577	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.1	Insurance	-	-	-	-	-	-	318	32	350	350	-	-	-	-	-	-	-	-	-	-
4f.4.2	Property taxes	-	-	-	-	-	-	27	3	29	29	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	446	-	-	-	-	-	112	558	558	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	5	1	-	18	-	5	29	29	-	-	-	247	-	-	-	4,938	8	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	453	68	520	520	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	454	45	499	499	-	-	-	-	-	-	-	-	-	-
4f.4.7	Emergency Planning Fees	-	-	-	-	-	-	345	35	380	-	380	-	-	-	-	-	-	-	-	-
4f.4.8	ISFSI Operating Costs	-	-	-	-	-	-	37	6	42	-	42	-	-	-	-	-	-	-	-	-
4f.4.9	NEI Fees	-	-	-	-	-	-	273	27	300	300	-	-	-	-	-	-	-	-	-	-
4f.4.10	Security Staff Cost	-	-	-	-	-	-	495	74	569	569	-	-	-	-	-	-	-	-	-	11,786
4f.4.11	DOC Staff Cost	-	-	-	-	-	-	3,882	582	4,464	4,464	-	-	-	-	-	-	-	-	-	46,750
4f.4.12	Utility Staff Cost	-	-	-	-	-	-	4,693	704	5,397	5,397	-	-	-	-	-	-	-	-	-	56,964
4f.4	Subtotal Period 4f Period-Dependent Costs	-	446	5	1	-	18	10,976	1,692	13,139	12,716	422	-	-	247	-	-	-	4,938	8	115,500
4f.0	TOTAL PERIOD 4f COST	-	446	5	1	-	18	20,125	3,831	24,427	21,427	2,999	-	-	247	-	-	-	4,938	92,184	118,620

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
<b>PERIOD 4 TOTALS</b>		3,632	46,486	21,327	17,134	8,674	51,299	169,474	66,401	384,427	372,873	6,592	4,962	129,137	1,204,550	751	393	-	122,338,400	698,413	1,712,540
<b>PERIOD 5b - Site Restoration</b>																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	7,917	-	-	-	-	-	1,188	9,104	-	-	9,104	-	-	-	-	-	-	114,045	-
5b.1.1.2	Intake & CWS	-	468	-	-	-	-	-	70	538	-	-	538	-	-	-	-	-	-	6,556	-
5b.1.1.3	Miscellaneous Structures	-	1,274	-	-	-	-	-	191	1,465	-	-	1,465	-	-	-	-	-	-	17,962	-
5b.1.1.4	Primary Water Tank Foundation - Contam	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	48	-
5b.1.1.5	Reactor Auxiliary	-	1,788	-	-	-	-	-	268	2,056	-	-	2,056	-	-	-	-	-	-	22,733	-
5b.1.1.6	Refueling Water Storage Tank - Contam	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	106	-
5b.1.1.7	Security Improvements	-	245	-	-	-	-	-	37	282	-	-	282	-	-	-	-	-	-	2,317	-
5b.1.1.8	Turbine	-	1,112	-	-	-	-	-	167	1,278	-	-	1,278	-	-	-	-	-	-	17,837	-
5b.1.1.9	Turbine Pedestal	-	821	-	-	-	-	-	123	945	-	-	945	-	-	-	-	-	-	8,825	-
5b.1.1.10	Fuel Handling	-	1,054	-	-	-	-	-	158	1,212	-	-	1,212	-	-	-	-	-	-	14,207	-
5b.1.1	Totals	-	14,688	-	-	-	-	-	2,203	16,891	-	-	16,891	-	-	-	-	-	-	204,636	-
Site Closeout Activities																					
5b.1.2	Remove Rubble	-	1,033	-	-	-	-	-	155	1,188	-	-	1,188	-	-	-	-	-	-	5,971	-
5b.1.3	Grade & landscape site	-	489	-	-	-	-	-	73	563	-	-	563	-	-	-	-	-	-	1,141	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-	-	-	-	667
5b.1	Subtotal Period 5b Activity Costs	-	16,210	-	-	-	-	80	2,443	18,733	92	-	18,642	-	-	-	-	-	-	211,748	667
Period 5b Additional Costs																					
5b.2.1	Concrete Crushing	-	422	-	-	-	-	4	64	490	-	-	490	-	-	-	-	-	-	2,212	-
5b.2.2	Intake and Discharge Cofferdams	-	675	-	-	-	-	-	101	776	-	-	776	-	-	-	-	-	-	6,265	-
5b.2	Subtotal Period 5b Additional Costs	-	1,097	-	-	-	-	4	165	1,266	-	-	1,266	-	-	-	-	-	-	8,477	-
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	163	-	-	-	-	-	24	188	-	-	188	-	-	-	-	-	-	-	-
5b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	3,366	505	3,871	-	3,871	-	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	163	-	-	-	-	3,366	529	4,059	-	3,871	188	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	788	79	867	780	87	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	66	7	73	-	73	-	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,265	-	-	-	-	-	940	7,204	-	-	7,204	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	561	84	645	-	-	645	-	-	-	-	-	-	-	-
5b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	346	35	381	-	381	-	-	-	-	-	-	-	-	-
5b.4.6	Emergency Planning Fees	-	-	-	-	-	-	857	86	942	-	942	-	-	-	-	-	-	-	-	-
5b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	91	14	105	-	105	-	-	-	-	-	-	-	-	-
5b.4.8	Security Staff Cost	-	-	-	-	-	-	1,121	168	1,289	0	967	322	-	-	-	-	-	-	-	25,838
5b.4.9	DOC Staff Cost	-	-	-	-	-	-	9,297	1,395	10,692	-	-	10,692	-	-	-	-	-	-	-	103,274
5b.4.10	Utility Staff Cost	-	-	-	-	-	-	4,252	638	4,889	-	1,222	3,667	-	-	-	-	-	-	-	50,663
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,265	-	-	-	-	17,379	3,444	27,088	780	3,777	22,530	-	-	-	-	-	-	-	179,775
5b.0	TOTAL PERIOD 5b COST	-	23,735	-	-	-	-	20,829	6,582	51,146	872	7,648	42,626	-	-	-	-	-	-	220,225	180,442
<b>PERIOD 5c - Fuel Storage Operations/Shipping</b>																					
Period 5c Direct Decommissioning Activities																					
Period 5c Collateral Costs																					
5c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	22,772	3,416	26,188	-	26,188	-	-	-	-	-	-	-	-	-
5c.3	Subtotal Period 5c Collateral Costs	-	-	-	-	-	-	22,772	3,416	26,188	-	26,188	-	-	-	-	-	-	-	-	-
Period 5c Period-Dependent Costs																					
5c.4.1	Insurance	-	-	-	-	-	-	9,267	927	10,194	-	10,194	-	-	-	-	-	-	-	-	-
5c.4.2	Property taxes	-	-	-	-	-	-	778	78	856	-	856	-	-	-	-	-	-	-	-	-
5c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4,066	407	4,473	-	4,473	-	-	-	-	-	-	-	-	-
5c.4.5	Emergency Planning Fees	-	-	-	-	-	-	10,055	1,006	11,061	-	11,061	-	-	-	-	-	-	-	-	-
5c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,074	161	1,235	-	1,235	-	-	-	-	-	-	-	-	-
5c.4.7	Security Staff Cost	-	-	-	-	-	-	30,130	4,520	34,650	-	34,650	-	-	-	-	-	-	-	-	617,606

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours		
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet					
Period 5c Period-Dependent Costs (continued)																							
5c.4.8	Utility Staff Cost	-	-	-	-	-	-	12,353	1,853	14,206	-	14,206	-	-	-	-	-	-	-	-	-	154,630	
5c.4	Subtotal Period 5c Period-Dependent Costs	-	-	-	-	-	-	67,724	8,950	76,674	-	76,674	-	-	-	-	-	-	-	-	-	772,236	
5c.0	TOTAL PERIOD 5c COST	-	-	-	-	-	-	90,496	12,366	102,862	-	102,862	-	-	-	-	-	-	-	-	-	772,236	
<b>PERIOD 5d - GTCC shipping</b>																							
Period 5d Direct Decommissioning Activities																							
Nuclear Steam Supply System Removal																							
5d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,374	-	-	13,243	-	2,330	16,947	16,947	-	-	-	-	-	-	-	2,886	567,289	-	-	
5d.1.1	Totals	-	-	1,374	-	-	13,243	-	2,330	16,947	16,947	-	-	-	-	-	-	-	2,886	567,289	-	-	
5d.1	Subtotal Period 5d Activity Costs	-	-	1,374	-	-	13,243	-	2,330	16,947	16,947	-	-	-	-	-	-	-	2,886	567,289	-	-	
Period 5d Collateral Costs																							
5d.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	6	1	6	-	6	-	-	-	-	-	-	-	-	-	-	
5d.3	Subtotal Period 5d Collateral Costs	-	-	-	-	-	-	6	1	6	-	6	-	-	-	-	-	-	-	-	-	-	
Period 5d Period-Dependent Costs																							
5d.4.1	Insurance	-	-	-	-	-	-	17	2	18	-	18	-	-	-	-	-	-	-	-	-	-	
5d.4.2	Property taxes	-	-	-	-	-	-	1	0	1	-	1	-	-	-	-	-	-	-	-	-	-	
5d.4.4	Emergency Planning Fees	-	-	-	-	-	-	18	2	19	-	19	-	-	-	-	-	-	-	-	-	-	
5d.4.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-	-	
5d.4.6	Security Staff Cost	-	-	-	-	-	-	53	8	61	-	61	-	-	-	-	-	-	-	-	-	1,080	
5d.4.7	Utility Staff Cost	-	-	-	-	-	-	22	3	25	-	25	-	-	-	-	-	-	-	-	-	270	
5d.4	Subtotal Period 5d Period-Dependent Costs	-	-	-	-	-	-	112	15	127	-	127	-	-	-	-	-	-	-	-	-	1,350	
5d.0	TOTAL PERIOD 5d COST	-	-	1,374	-	-	13,243	118	2,346	17,080	16,947	133	-	-	-	-	-	-	2,886	567,289	-	1,350	
<b>PERIOD 5e - ISFSI Decontamination</b>																							
Period 5e Direct Decommissioning Activities																							
Period 5e Additional Costs																							
5e.2.1	Decommissioning of ISFSI	-	339	3	649	-	1,015	1,308	828	4,141	4,141	-	-	-	14,954	-	-	-	-	2,185,620	12,534	1,020	
5e.2	Subtotal Period 5e Additional Costs	-	339	3	649	-	1,015	1,308	828	4,141	4,141	-	-	-	14,954	-	-	-	-	2,185,620	12,534	1,020	
Period 5e Collateral Costs																							
5e.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	29	7	36	36	-	-	-	-	-	-	-	-	-	-	-	
5e.3	Subtotal Period 5e Collateral Costs	-	-	-	-	-	-	29	7	36	36	-	-	-	-	-	-	-	-	-	-	-	
Period 5e Period-Dependent Costs																							
5e.4.1	Insurance	-	-	-	-	-	-	68	17	85	85	-	-	-	-	-	-	-	-	-	-	-	
5e.4.2	Property taxes	-	-	-	-	-	-	12	3	15	15	-	-	-	-	-	-	-	-	-	-	-	
5e.4.3	Plant energy budget	-	-	-	-	-	-	100	25	124	124	-	-	-	-	-	-	-	-	-	-	-	
5e.4.4	Security Staff Cost	-	-	-	-	-	-	74	18	92	92	-	-	-	-	-	-	-	-	-	-	1,729	
5e.4.5	Utility Staff Cost	-	-	-	-	-	-	159	40	199	199	-	-	-	-	-	-	-	-	-	-	1,901	
5e.4	Subtotal Period 5e Period-Dependent Costs	-	-	-	-	-	-	412	103	515	515	-	-	-	-	-	-	-	-	-	-	3,630	
5e.0	TOTAL PERIOD 5e COST	-	339	3	649	-	1,015	1,749	939	4,693	4,693	-	-	-	14,954	-	-	-	-	2,185,620	12,534	4,650	
<b>PERIOD 5f - ISFSI Site Restoration</b>																							
Period 5f Direct Decommissioning Activities																							
Period 5f Additional Costs																							
5f.2.1	Demolition of ISFSI	-	745	-	-	-	-	28	116	890	-	-	890	-	-	-	-	-	-	-	-	4,137	80
5f.2	Subtotal Period 5f Additional Costs	-	745	-	-	-	-	28	116	890	-	-	890	-	-	-	-	-	-	-	-	4,137	80
Period 5f Collateral Costs																							
5f.3.1	Small tool allowance	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	-	-	-
5f.3	Subtotal Period 5f Collateral Costs	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	-	-	-

**Table C-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**Integrated DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 5f Period-Dependent Costs																						
5f.4.2	Property taxes	-	-	-	-	-	-	6	1	7	-	-	7	-	-	-	-	-	-	-	-	-
5f.4.3	Heavy equipment rental	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	-	-	-
5f.4.4	Plant energy budget	-	-	-	-	-	-	50	8	58	-	-	58	-	-	-	-	-	-	-	-	-
5f.4.5	Security Staff Cost	-	-	-	-	-	-	15	2	17	-	-	17	-	-	-	-	-	-	-	-	349
5f.4.6	Utility Staff Cost	-	-	-	-	-	-	69	10	79	-	-	79	-	-	-	-	-	-	-	-	784
5f.4	Subtotal Period 5f Period-Dependent Costs	-	14	-	-	-	-	140	23	177	-	-	177	-	-	-	-	-	-	-	-	1,133
5f.0	TOTAL PERIOD 5f COST	-	765	-	-	-	-	168	140	1,074	-	-	1,074	-	-	-	-	-	-	-	4,137	1,213
<b>PERIOD 5 TOTALS</b>		-	24,840	1,377	649	-	14,258	113,360	22,372	176,854	22,512	110,643	43,700	-	14,954	-	-	2,886	2,752,909	236,896	959,891	
<b>TOTAL COST TO DECOMMISSION</b>		<b>8,474</b>	<b>80,363</b>	<b>23,639</b>	<b>19,183</b>	<b>13,837</b>	<b>67,941</b>	<b>582,876</b>	<b>138,336</b>	<b>934,649</b>	<b>589,149</b>	<b>296,190</b>	<b>49,309</b>	<b>156,154</b>	<b>1,238,068</b>	<b>751</b>	<b>393</b>	<b>2,886</b>	<b>126,853,200</b>	<b>1,049,021</b>	<b>4,874,799</b>	

<b>TOTAL COST TO DECOMMISSION WITH 17.37% CONTINGENCY:</b>	<b>\$934,649</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL NRC LICENSE TERMINATION COST IS 63.03% OR:</b>	<b>\$589,149</b>	<b>thousands of 2015 dollars</b>
<b>SPENT FUEL MANAGEMENT COST IS 31.69% OR:</b>	<b>\$296,190</b>	<b>thousands of 2015 dollars</b>
<b>NON-NUCLEAR DEMOLITION COST IS 5.28% OR:</b>	<b>\$49,309</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):</b>	<b>1,239,212</b>	<b>cubic feet</b>
<b>TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:</b>	<b>2,886</b>	<b>cubic feet</b>
<b>TOTAL SCRAP METAL REMOVED:</b>	<b>40,387</b>	<b>tons</b>
<b>TOTAL CRAFT LABOR REQUIREMENTS:</b>	<b>1,049,021</b>	<b>man-hours</b>

End Notes:

n/a - indicates that this activity not charged as decommissioning expense.  
a - indicates that this activity performed by decommissioning staff.  
0 - indicates that this value is less than 0.5 but is non-zero.  
a cell containing " - " indicates a zero value

Table C-2  
St. Lucie Nuclear Plant, Unit 2  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
<b>PERIOD 1a - Shutdown through Transition</b>																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.3	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-
1a.1.4	Notification of Permanent Defueling	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	239	36	275	275	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	550	82	632	632	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	896	134	1,031	1,031	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	371	56	426	426	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	598	90	687	687	-	-	-	-	-	-	-	-	-	5,000
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	490	73	563	563	-	-	-	-	-	-	-	-	-	4,096
1a.1.16	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	588	88	676	609	-	68	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	498	75	573	515	-	57	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	849	127	976	976	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	777	117	893	893	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	373	56	429	429	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	191	29	220	110	-	110	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	48	7	55	-	-	55	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	48	7	55	-	-	55	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	373	56	429	214	-	214	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	550	82	632	632	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	108	16	124	62	-	62	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,521	678	5,199	4,578	-	621	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	287	43	330	330	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,100	465	3,565	3,565	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	167	25	192	192	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	147	22	169	169	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	14,215	2,132	16,347	15,726	-	621	-	-	-	-	-	-	-	73,753
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,447	1,117	8,564	-	8,564	-	-	-	-	-	-	-	-	-
1a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
1a.3.3	Fixed Overhead	-	-	-	-	-	-	806	121	927	927	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	8,253	1,238	9,491	928	8,564	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,722	172	1,895	1,895	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	643	64	707	707	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	369	-	-	-	-	-	92	462	462	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	658	-	-	-	-	-	99	757	757	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	10	3	-	35	-	10	58	58	-	-	-	493	-	-	-	9,854	16	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	3,003	451	3,454	3,454	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	972	97	1,070	1,070	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	667	67	734	-	734	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	797	120	917	-	917	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	-
1a.4.11	INPO Fees	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	-
1a.4.12	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,191	1,079	8,269	8,269	-	-	-	-	-	-	-	-	-	147,043
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	31,064	4,660	35,724	35,724	-	-	-	-	-	-	-	-	-	423,400

**Table C-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,028	10	3	-	35	47,312	7,038	55,425	53,718	1,707	-	-	493	-	-	-	9,854	16	570,443
1a.0	TOTAL PERIOD 1a COST	-	1,028	10	3	-	35	69,780	10,408	81,264	70,372	10,271	621	-	493	-	-	-	9,854	16	644,196
<b>PERIOD 1b - Decommissioning Preparations</b>																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	566	85	651	585	-	65	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	299	45	344	344	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	161	24	186	46	-	139	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	434	65	499	499	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	143	22	165	82	-	82	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	54	8	62	62	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	143	22	165	165	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	550	82	632	632	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	120	18	137	69	-	69	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	186	28	214	-	-	214	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	186	28	214	-	-	214	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	326	49	375	338	-	38	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	326	49	375	338	-	38	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,973	596	4,569	3,710	-	859	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	603	-	-	-	-	-	-	302	905	905	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	603	-	-	-	-	-	3,973	898	5,474	4,615	-	859	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,391	1,109	8,500	8,500	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	5,740	1,722	7,463	7,463	-	-	-	-	-	-	-	-	30,500	10,852
1b.2.3	Misc Hazardous Waste	-	-	665	169	5,164	-	-	866	6,863	6,863	-	-	27,017	-	-	-	-	1,397,259	5,520	-
1b.2	Subtotal Period 1b Additional Costs	-	-	665	169	5,164	-	13,132	3,697	22,826	22,826	-	-	27,017	-	-	-	-	1,397,259	36,020	10,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	860	-	-	-	-	-	-	129	989	989	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	45	-	28	127	-	119	-	74	394	394	-	-	-	288	-	-	-	-	-	-
1b.3.4	Process decommissioning chemical flush waste	2	-	68	400	-	3,102	-	843	4,414	4,414	-	-	-	-	726	-	-	17,272	56	-
1b.3.5	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,600	-	-	-	-	-	-	240	1,840	1,840	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,452	368	2,820	-	2,820	-	-	-	-	-	-	-	-	-
1b.3.9	Florida LLRW Inspection Fee	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-
1b.3.10	Fixed Overhead	-	-	-	-	-	-	408	61	470	470	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,507	1,202	96	526	-	3,221	4,051	2,074	13,678	10,858	2,820	-	-	288	726	-	-	94,645	192	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	27	-	-	-	-	-	-	7	33	33	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	865	86	951	951	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	18	2	20	20	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	241	-	-	-	-	-	60	301	301	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	334	-	-	-	-	-	50	384	384	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	6	2	-	22	-	6	36	36	-	-	-	303	-	-	-	6,050	10	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	3,045	457	3,501	3,501	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	254	25	279	279	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	338	34	372	-	372	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	404	61	465	-	465	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	25	4	29	-	29	-	-	-	-	-	-	-	-	-
1b.4.12	NEI Fees	-	-	-	-	-	-	184	18	202	202	-	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	3,194	479	3,673	3,673	-	-	-	-	-	-	-	-	-	63,957
1b.4.14	DOC Staff Cost	-	-	-	-	-	-	5,481	822	6,303	6,303	-	-	-	-	-	-	-	-	-	64,486
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	15,829	2,374	18,203	18,203	-	-	-	-	-	-	-	-	-	215,657

**Table C-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
1b.4	Subtotal Period 1b Period-Dependent Costs	27	574	6	2	-	22	29,635	4,485	34,751	33,886	865	-	-	303	-	-	-	6,050	10	344,100
1b.0	TOTAL PERIOD 1b COST	3,137	1,776	766	697	5,164	3,243	50,791	11,155	76,729	72,185	3,685	859	27,017	590	726	-	-	1,497,955	37,289	388,195
<b>PERIOD 1 TOTALS</b>		<b>3,137</b>	<b>2,804</b>	<b>776</b>	<b>700</b>	<b>5,164</b>	<b>3,278</b>	<b>120,572</b>	<b>21,563</b>	<b>157,992</b>	<b>142,557</b>	<b>13,955</b>	<b>1,480</b>	<b>27,017</b>	<b>1,083</b>	<b>726</b>	<b>-</b>	<b>-</b>	<b>1,507,809</b>	<b>37,305</b>	<b>1,032,391</b>
<b>PERIOD 2a - Large Component Removal</b>																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	62	50	9	24	-	201	-	98	444	444	-	-	-	495	-	-	-	56,538	2,256	-
2a.1.1.2	Pressurizer Relief Tank	7	6	2	4	-	31	-	13	62	62	-	-	-	78	-	-	-	8,699	255	-
2a.1.1.3	Reactor Coolant Pumps & Motors	158	87	121	162	-	2,140	-	672	3,341	3,341	-	-	-	6,541	-	-	-	564,000	5,552	100
2a.1.1.4	Pressurizer	38	51	502	113	-	1,098	-	374	2,177	2,177	-	-	-	3,358	-	-	-	277,233	2,397	938
2a.1.1.5	Steam Generators	198	3,338	2,105	3,892	1,633	4,820	-	3,178	19,165	19,165	-	-	30,926	14,737	-	-	-	2,605,940	11,617	2,875
2a.1.1.6	CRDMs/ICIs/Service Structure Removal	162	296	275	130	-	648	-	364	1,875	1,875	-	-	-	4,243	-	-	-	182,094	9,238	-
2a.1.1.7	Reactor Vessel Internals	102	3,236	14,223	2,009	-	8,300	342	10,737	38,948	38,948	-	-	-	1,502	505	393	-	261,594	31,550	1,394
2a.1.1.8	Reactor Vessel	103	5,313	2,490	1,837	-	3,110	342	6,724	19,918	19,918	-	-	-	9,265	-	-	-	946,715	31,550	1,394
2a.1.1	Totals	829	12,378	19,725	8,172	1,633	20,348	684	22,161	85,930	85,930	-	-	30,926	40,219	505	393	-	4,902,813	94,414	6,701
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	345	201	166	404	1,076	-	461	2,652	2,652	-	-	5,188	4,574	-	-	-	535,807	7,313	-
2a.1.3	Main Condensers	-	1,042	228	188	459	1,222	-	686	3,824	3,824	-	-	5,890	5,193	-	-	-	608,323	22,471	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	*Reactor	-	1,378	-	-	-	-	-	207	1,585	1,585	-	-	-	-	-	-	-	-	19,868	-
2a.1.4.2	Reactor Auxiliary	-	198	-	-	-	-	-	30	228	228	-	-	-	-	-	-	-	-	2,515	-
2a.1.4.3	Steam Generator Blowdown Treatment	-	27	-	-	-	-	-	4	31	31	-	-	-	-	-	-	-	-	374	-
2a.1.4.4	Fuel Handling	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	1,519	-
2a.1.4	Totals	-	1,718	-	-	-	-	-	258	1,976	1,976	-	-	-	-	-	-	-	-	24,277	-
Disposal of Plant Systems																					
2a.1.5.1	Air Evacuation	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	177	-
2a.1.5.2	Air Evacuation - Insulated	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	777	-
2a.1.5.3	Auxiliary Steam - Insulated	-	17	-	-	-	-	-	3	19	-	-	19	-	-	-	-	-	-	410	-
2a.1.5.4	Chemical & Volume Control	117	115	15	22	44	147	-	135	595	595	-	-	633	638	-	-	-	66,846	4,624	-
2a.1.5.5	Chemical & Volume Control - Insulated	717	625	77	82	5	652	-	699	2,856	2,856	-	-	73	2,759	-	-	-	186,014	26,427	-
2a.1.5.6	Chemical Feed	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	71	-
2a.1.5.7	Chemical Feed - Insulated	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	42	-
2a.1.5.8	Circulating & Intake Cooling Water	-	273	-	-	-	-	-	41	314	-	-	314	-	-	-	-	-	-	6,590	-
2a.1.5.9	Component Cooling	-	91	-	-	-	-	-	14	105	-	-	105	-	-	-	-	-	-	2,187	-
2a.1.5.10	Component Cooling - RCA	-	347	58	104	476	540	-	315	1,841	1,841	-	-	6,782	2,293	-	-	-	427,071	6,932	-
2a.1.5.11	Condensate	-	199	-	-	-	-	-	30	229	-	-	229	-	-	-	-	-	-	4,668	-
2a.1.5.12	Condensate - Insulated	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	2,879	-
2a.1.5.13	Condensate Recovery	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	113	-
2a.1.5.14	Condensate Recovery - Insulated	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	15	-
2a.1.5.15	Condensate Recovery - Insulated - RCA	-	1	0	0	0	1	-	0	2	2	-	-	2	3	-	-	-	293	15	-
2a.1.5.16	Condensate Recovery - RCA	-	12	1	2	9	8	-	7	39	39	-	-	134	33	-	-	-	7,654	236	-
2a.1.5.17	Condenser Tube Cleaning	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	920	-
2a.1.5.18	Demineralized Makeup Water	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	137	-
2a.1.5.19	Demineralized Makeup Water - RCA	-	6	1	1	1	6	-	3	19	19	-	-	12	27	-	-	-	2,308	101	-
2a.1.5.20	Domestic/Makeup/Service Water	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	215	-
2a.1.5.21	Domestic/Makeup/Service Water - RCA	-	23	2	3	6	23	-	13	71	71	-	-	88	98	-	-	-	10,067	409	-
2a.1.5.22	Domestic/Makeup/Service Water-Ins	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	19	-
2a.1.5.23	Domestic/Makeup/Service Water-Ins - RCA	-	2	0	0	0	2	-	1	7	7	-	-	6	9	-	-	-	822	44	-
2a.1.5.24	Electrical - Clean	-	3,577	-	-	-	-	-	537	4,114	-	-	4,114	-	-	-	-	-	-	81,595	-
2a.1.5.25	Extraction Steam	-	83	-	-	-	-	-	12	96	-	-	96	-	-	-	-	-	-	1,887	-
2a.1.5.26	Extraction Steam - Insulated	-	93	-	-	-	-	-	14	107	-	-	107	-	-	-	-	-	-	2,280	-
2a.1.5.27	Feedwater - Insulated	-	126	-	-	-	-	-	19	145	-	-	145	-	-	-	-	-	-	3,077	-
2a.1.5.28	Feedwater - Insulated - RCA	-	42	6	10	46	50	-	32	186	186	-	-	662	213	-	-	-	40,945	828	-
2a.1.5.29	Fire Protection	-	54	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	1,310	-
2a.1.5.30	Fire Protection - Insulated	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	145	-
2a.1.5.31	HVAC	-	261	-	-	-	-	-	39	300	-	-	300	-	-	-	-	-	-	6,876	-
2a.1.5.32	Heater Drain & Vents - Insulated	-	222	-	-	-	-	-	33	255	-	-	255	-	-	-	-	-	-	5,363	-
2a.1.5.33	Hydrogen Sampling	-	50	5	7	27	38	-	28	154	154	-	-	378	162	-	-	-	26,104	1,037	-

Table C-2  
St. Lucie Nuclear Plant, Unit 2  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
Disposal of Plant Systems (continued)																					
2a.1.5.34	Integrated Leak Rate Testing	-	36	3	4	16	25	-	18	101	101	-	-	224	105	-	-	-	16,086	714	-
2a.1.5.35	Main Steam - Insulated	-	202	-	-	-	-	-	30	232	-	-	232	-	-	-	-	-	-	4,827	-
2a.1.5.36	Main Steam - Insulated - RCA	-	44	6	10	52	52	-	34	197	197	-	-	733	221	-	-	-	44,394	874	-
2a.1.5.37	Misc Bulk Gas Supply	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	346	-
2a.1.5.38	Misc Bulk Gas Supply - RCA	-	11	1	1	1	10	-	6	31	31	-	-	18	43	-	-	-	3,603	193	-
2a.1.5.39	Miscellaneous	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	33	-
2a.1.5.40	Miscellaneous - RCA	-	5	1	2	11	9	-	5	32	32	-	-	155	37	-	-	-	8,715	98	-
2a.1.5.41	Post Accident Sampling	-	3	0	0	-	1	-	1	5	5	-	-	-	3	-	-	-	205	78	-
2a.1.5.42	Post Accident Sampling - Insulated	-	30	1	1	-	7	-	9	47	47	-	-	-	28	-	-	-	1,842	699	-
2a.1.5.43	RCP Oil Collection	-	8	1	1	1	8	-	4	23	23	-	-	10	36	-	-	-	2,778	142	-
2a.1.5.44	SGBTf Blowdown - Insulated	-	740	39	80	555	293	-	357	2,063	2,063	-	-	7,896	1,252	-	-	-	402,818	15,355	-
2a.1.5.45	SGBTf Demin - Ins - RCA	-	50	4	6	9	42	-	26	136	136	-	-	128	179	-	-	-	17,046	957	-
2a.1.5.46	SGBTf Demin - RCA	-	73	6	11	60	48	-	41	239	239	-	-	850	206	-	-	-	48,069	1,427	-
2a.1.5.47	SGBTf Miscellaneous - RCA	-	25	2	4	29	11	-	14	84	84	-	-	408	48	-	-	-	19,713	513	-
2a.1.5.48	SGBTf Waste Management	-	68	3	7	62	14	-	31	185	185	-	-	888	60	-	-	-	39,969	1,443	-
2a.1.5.49	SGBTf Waste Management - Insulated	-	65	4	6	12	42	-	30	158	158	-	-	165	176	-	-	-	18,383	1,328	-
2a.1.5.50	Safety Injection	-	232	71	104	257	673	-	288	1,625	1,625	-	-	3,662	2,868	-	-	-	337,806	4,897	-
2a.1.5.51	Safety Injection - Insulated	-	853	105	128	163	929	-	500	2,677	2,677	-	-	2,318	3,935	-	-	-	355,016	16,626	-
2a.1.5.52	Sampling	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	236	-
2a.1.5.53	Sampling - Insulated	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	328	-
2a.1.5.54	Sampling - Insulated - RCA	-	34	4	4	4	31	-	18	95	95	-	-	56	131	-	-	-	10,932	597	-
2a.1.5.55	Sampling - RCA	-	29	3	3	7	23	-	15	80	80	-	-	101	97	-	-	-	10,509	535	-
2a.1.5.56	Secondary Side Wet Layup	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	308	-
2a.1.5.57	Secondary Side Wet Layup - Ins	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	399	-
2a.1.5.58	Service & Instrument Air	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	485	-
2a.1.5.59	Service & Instrument Air - Ins	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	258	-
2a.1.5.60	Sodium Hypochlorite	-	47	-	-	-	-	-	7	54	-	-	54	-	-	-	-	-	-	1,137	-
2a.1.5.61	Steam Gen Blowdown Cooling	-	17	-	-	-	-	-	3	19	-	-	19	-	-	-	-	-	-	387	-
2a.1.5.62	Steam Gen Blowdown Cooling - Ins - RCA	-	57	8	13	60	70	-	43	251	251	-	-	849	296	-	-	-	54,068	1,117	-
2a.1.5.63	Steam Gen Blowdown Cooling - Insulated	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	47	-
2a.1.5.64	Steam Gen Blowdown Cooling - RCA	-	76	11	18	81	97	-	59	343	343	-	-	1,153	412	-	-	-	74,067	1,473	-
2a.1.5.65	Steam Generator Blowdown	-	27	2	3	6	17	-	12	67	67	-	-	87	70	-	-	-	8,152	583	-
2a.1.5.66	Steam Generator Blowdown - Insulated	-	63	4	6	11	40	-	29	152	152	-	-	162	170	-	-	-	17,803	1,284	-
2a.1.5.67	Turbine	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	29	-
2a.1.5.68	Turbine Cooling Water	-	61	-	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	1,431	-
2a.1.5.69	Turbine Cooling Water - Insulated	-	42	-	-	-	-	-	6	49	-	-	49	-	-	-	-	-	-	1,050	-
2a.1.5.70	Turbine Lube Oil & Diesel Oil	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	1,468	-
2a.1.5	Totals	835	9,505	441	643	2,011	3,907	-	3,637	20,979	14,361	-	6,617	28,630	16,609	-	-	-	2,260,095	226,110	-
2a.1.6	Scaffolding in support of decommissioning	-	806	16	6	58	15	-	217	1,118	1,118	-	-	739	65	-	-	-	37,585	20,151	-
2a.1	Subtotal Period 2a Activity Costs	1,664	25,795	20,610	9,175	4,564	26,569	684	27,419	116,479	109,862	-	6,617	71,373	66,661	505	393	-	8,344,623	394,737	6,701
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,823	547	2,369	2,369	-	-	-	-	-	-	-	-	34,454	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	1,823	547	2,369	2,369	-	-	-	-	-	-	-	-	34,454	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	108	-	67	304	-	287	-	178	944	944	-	-	-	692	-	-	-	41,545	135	-
2a.3.2	Process decommissioning chemical flush waste	1	-	20	117	-	157	-	59	353	353	-	-	-	213	-	-	-	22,656	40	-
2a.3.3	Small tool allowance	-	314	-	-	-	-	-	47	361	325	-	36	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	8,429	1,264	9,694	-	9,694	-	-	-	-	-	-	-	-	-
2a.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	143	14	158	158	-	-	-	-	-	-	-	-	-	-
2a.3.6	Fixed Overhead	-	-	-	-	-	-	1,336	200	1,536	1,536	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	108	314	87	421	-	444	9,908	1,763	13,046	3,316	9,694	36	-	905	-	-	-	64,201	175	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	87	-	-	-	-	-	-	22	109	109	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	700	70	770	770	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	59	6	65	58	-	6	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	2,506	-	-	-	-	-	627	3,133	3,133	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,934	-	-	-	-	-	590	4,524	4,524	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	99	30	-	358	-	104	591	591	-	-	-	5,031	-	-	-	100,613	164	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	4,729	709	5,439	5,439	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	779	78	857	857	-	-	-	-	-	-	-	-	-	-

**Table C-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2a Period-Dependent Costs (continued)																					
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	760	76	836	-	836	-	-	-	-	-	-	-	-	-
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,322	198	1,520	-	1,520	-	-	-	-	-	-	-	-	-
2a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	81	12	93	-	93	-	-	-	-	-	-	-	-	-
2a.4.12	NEI Fees	-	-	-	-	-	-	601	60	661	661	-	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	10,445	1,567	12,012	12,012	-	-	-	-	-	-	-	-	-	209,157
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	22,544	3,382	25,925	25,925	-	-	-	-	-	-	-	-	-	262,743
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	37,122	5,568	42,690	42,690	-	-	-	-	-	-	-	-	-	489,186
2a.4	Subtotal Period 2a Period-Dependent Costs	87	6,440	99	30	-	358	79,141	13,069	99,223	96,768	2,449	6	-	5,031	-	-	-	100,613	164	961,086
2a.0	TOTAL PERIOD 2a COST	1,859	32,549	20,796	9,627	4,564	27,371	91,555	42,797	231,118	212,315	12,143	6,660	71,373	72,597	505	393	-	8,509,437	429,530	967,787
<b>PERIOD 2b - Site Decontamination</b>																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Contnmnt Spray & Refueling Water	-	453	133	196	318	1,376	-	548	3,024	3,024	-	-	4,526	5,919	-	-	-	570,426	9,815	-
2b.1.1.2	Contnmnt Spray & Refueling Water - Ins	-	192	41	62	57	461	-	185	998	998	-	-	816	1,958	-	-	-	162,673	4,075	-
2b.1.1.3	Electrical - Contaminated	-	505	23	41	124	252	-	216	1,161	1,161	-	-	1,762	1,073	-	-	-	142,482	9,911	-
2b.1.1.4	Electrical - Decontaminated	-	3,205	211	373	1,133	2,287	-	1,620	8,830	8,830	-	-	16,129	9,719	-	-	-	1,297,399	59,268	-
2b.1.1.5	Emergency Diesel Generator	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	2,134	-
2b.1.1.6	Emergency Diesel Generator - Insulated	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	221	-
2b.1.1.7	Fire Protection - Insulated - RCA	-	5	0	1	3	4	-	3	17	17	-	-	49	19	-	-	-	3,226	93	-
2b.1.1.8	Fire Protection - RCA	-	54	5	9	40	50	-	34	193	193	-	-	576	210	-	-	-	37,330	1,069	-
2b.1.1.9	HVAC - Contaminated	-	1,776	68	179	1,651	406	-	827	4,906	4,906	-	-	23,493	1,725	-	-	-	1,068,102	34,000	-
2b.1.1.10	Primary Water	-	161	21	34	78	228	-	116	639	639	-	-	1,114	997	-	-	-	109,217	3,415	-
2b.1.1.11	Primary Water - Insulated	-	3	0	0	0	3	-	1	7	7	-	-	1	11	-	-	-	746	58	-
2b.1.1.12	Radiation Monitoring	-	23	1	1	1	10	-	9	47	47	-	-	18	44	-	-	-	3,646	499	-
2b.1.1.13	Reactor Coolant - Insulated	-	76	8	9	7	65	-	38	202	202	-	-	98	275	-	-	-	22,195	1,630	-
2b.1.1.14	Refueling Equipment	-	151	13	24	63	150	-	89	489	489	-	-	890	637	-	-	-	78,238	3,301	-
2b.1.1.15	Secondary Side Wet Layup - Ins - RCA	-	14	2	2	2	14	-	8	41	41	-	-	33	59	-	-	-	5,240	240	-
2b.1.1.16	Secondary Side Wet Layup - RCA	-	13	1	2	9	10	-	8	44	44	-	-	133	43	-	-	-	8,247	241	-
2b.1.1.17	Service & Instrument Air - Ins - RCA	-	46	4	5	6	35	-	22	117	117	-	-	81	146	-	-	-	13,020	890	-
2b.1.1.18	Service & Instrument Air - RCA	-	28	3	3	3	22	-	14	72	72	-	-	40	92	-	-	-	7,706	550	-
2b.1.1.19	Waste Management	811	742	101	140	229	978	-	901	3,902	3,902	-	-	3,264	4,230	-	-	-	407,223	30,911	-
2b.1.1.20	Waste Management - Insulated	1,730	1,409	185	191	9	1,529	-	1,648	6,702	6,702	-	-	133	6,470	-	-	-	434,869	61,832	-
2b.1.1	Totals	2,541	8,950	821	1,272	3,735	7,879	-	6,301	31,499	31,391	-	108	53,157	33,625	-	-	-	4,371,987	224,150	-
2b.1.2	Scaffolding in support of decommissioning	-	1,008	20	8	72	19	-	271	1,397	1,397	-	-	924	81	-	-	-	46,982	25,189	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	1,096	1,562	67	894	221	1,785	-	1,559	7,186	7,186	-	-	3,150	22,340	-	-	-	1,911,450	50,692	-
2b.1.3.2	Primary Water Tank & Pump - Contaminated	0	6	1	13	-	18	-	8	47	47	-	-	-	301	-	-	-	26,046	122	-
2b.1.3.3	Reactor Auxiliary	512	259	9	128	70	181	-	397	1,557	1,557	-	-	995	2,881	-	-	-	288,493	15,528	-
2b.1.3.4	Steam Generator Blowdown Treatment	166	63	2	41	2	58	-	120	452	452	-	-	28	952	-	-	-	83,591	4,600	-
2b.1.3	Totals	1,775	1,891	80	1,077	293	2,042	-	2,084	9,242	9,242	-	-	4,173	26,473	-	-	-	2,309,580	70,942	-
2b.1	Subtotal Period 2b Activity Costs	4,316	11,848	921	2,357	4,100	9,940	-	8,656	42,138	42,029	-	108	58,255	60,180	-	-	-	6,728,549	320,281	-
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,732	820	3,552	3,552	-	-	-	-	-	-	-	-	51,653	-
2b.2.2	Contaminated Soil Remediation	-	1,405	731	5,547	-	14,547	-	4,893	27,123	27,123	-	-	-	948,730	-	-	-	94,873,010	15,812	-
2b.2.3	Soil - Clean Closure	-	-	-	-	-	-	148	22	171	171	-	-	-	-	-	-	-	-	-	-
2b.2.4	Underground Services Excavation	-	1,211	-	-	-	-	542	263	2,016	-	-	2,016	-	-	-	-	-	-	8,000	-
2b.2.5	Storm Drain Remediation	-	153	60	177	-	425	-	177	992	992	-	-	-	27,763	-	-	-	2,768,792	3,071	-
2b.2	Subtotal Period 2b Additional Costs	-	2,769	791	5,724	-	14,971	3,423	6,175	33,854	31,838	-	2,016	-	976,493	-	-	-	97,641,800	78,536	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	136	-	88	397	-	374	-	230	1,225	1,225	-	-	-	903	-	-	-	54,164	176	-
2b.3.2	Process decommissioning chemical flush waste	1	-	52	305	-	407	-	153	918	918	-	-	-	553	-	-	-	58,939	104	-
2b.3.3	Small tool allowance	-	244	-	-	-	-	-	37	280	280	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	39,632	5,945	45,577	-	45,577	-	-	-	-	-	-	-	-	-
2b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	2,034	203	2,238	2,238	-	-	-	-	-	-	-	-	-	-
2b.3.6	Fixed Overhead	-	-	-	-	-	-	2,002	300	2,303	2,303	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	138	244	139	701	-	782	43,669	6,869	52,541	6,964	45,577	-	-	1,456	-	-	-	113,103	280	-

**Table C-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	923	-	-	-	-	-	-	231	1,153	1,153	-	-	-	-	-	-	-	-	-	
2b.4.2	Insurance	-	-	-	-	-	-	1,048	105	1,153	1,153	-	-	-	-	-	-	-	-	-	
2b.4.3	Property taxes	-	-	-	-	-	-	88	9	97	97	-	-	-	-	-	-	-	-	-	
2b.4.4	Health physics supplies	-	2,571	-	-	-	-	-	643	3,214	3,214	-	-	-	-	-	-	-	-	-	
2b.4.5	Heavy equipment rental	-	6,056	-	-	-	-	-	908	6,964	6,964	-	-	-	-	-	-	-	-	-	
2b.4.6	Disposal of DAW generated	-	-	100	30	-	363	-	105	599	599	-	-	-	5,098	-	-	-	101,965	166	
2b.4.7	Plant energy budget	-	-	-	-	-	-	5,598	840	6,437	6,437	-	-	-	-	-	-	-	-	-	
2b.4.8	NRC Fees	-	-	-	-	-	-	1,094	109	1,204	1,204	-	-	-	-	-	-	-	-	-	
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,139	114	1,253	-	1,253	-	-	-	-	-	-	-	-	
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,981	297	2,279	-	2,279	-	-	-	-	-	-	-	-	
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	501	75	577	577	-	-	-	-	-	-	-	-	-	
2b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	122	18	140	-	140	-	-	-	-	-	-	-	-	
2b.4.13	NEI Fees	-	-	-	-	-	-	900	90	990	990	-	-	-	-	-	-	-	-	-	
2b.4.14	Security Staff Cost	-	-	-	-	-	-	15,659	2,349	18,008	18,008	-	-	-	-	-	-	-	-	313,563	
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	23,360	3,504	26,864	26,864	-	-	-	-	-	-	-	-	279,874	
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	38,223	5,733	43,956	43,956	-	-	-	-	-	-	-	-	520,877	
2b.4	Subtotal Period 2b Period-Dependent Costs	923	8,627	100	30	-	363	89,714	15,131	114,888	111,217	3,671	-	-	5,098	-	-	-	101,965	166	1,114,314
2b.0	TOTAL PERIOD 2b COST	5,376	23,488	1,951	8,813	4,100	26,056	136,806	36,831	243,421	192,048	49,249	2,124	58,255	1,043,227	-	-	-	104,585,400	399,263	1,114,314
<b>PERIOD 2d - Decontamination Following Wet Fuel Storage</b>																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	497	50	183	132	-	1,062	-	565	2,489	2,489	-	-	-	4,513	-	-	-	298,275	1,243	-
Disposal of Plant Systems																					
2d.1.2.1	Fuel Pool	155	128	23	33	27	252	-	184	802	802	-	-	384	1,069	-	-	-	86,300	4,160	-
2d.1.2.2	Fuel Pool - Insulated	78	76	10	13	6	98	-	86	368	368	-	-	81	417	-	-	-	30,951	2,723	-
2d.1.2.3	Spent Fuel	0	12	2	3	3	22	-	10	51	51	-	-	39	94	-	-	-	7,778	253	-
2d.1.2.4	Spent Fuel - Ins	0	2	0	0	-	2	-	1	5	5	-	-	-	8	-	-	-	516	30	-
2d.1.2	Totals	233	218	36	49	35	374	-	281	1,226	1,226	-	-	504	1,588	-	-	-	125,545	7,166	-
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Handling	412	444	5	26	117	38	-	348	1,390	1,390	-	-	1,664	442	-	-	-	104,278	17,393	-
2d.1.3	Totals	412	444	5	26	117	38	-	348	1,390	1,390	-	-	1,664	442	-	-	-	104,278	17,393	-
2d.1.4	Scaffolding in support of decommissioning	-	202	4	2	14	4	-	54	279	279	-	-	185	16	-	-	-	9,396	5,038	-
2d.1	Subtotal Period 2d Activity Costs	1,142	913	228	209	167	1,477	-	1,248	5,385	5,385	-	-	2,353	6,559	-	-	-	537,494	30,840	-
Period 2d Additional Costs																					
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,088	326	1,414	1,414	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	557	167	725	725	-	-	-	-	-	-	-	-	10,536	-
2d.2.3	Operational Equipment	-	-	17	54	506	-	-	86	663	663	-	-	11,710	-	-	-	-	292,750	32	-
2d.2	Subtotal Period 2d Additional Costs	-	-	17	54	506	-	1,645	579	2,802	2,802	-	-	11,710	-	-	-	-	292,750	10,567	6,240
Period 2d Collateral Costs																					
2d.3.1	Process decommissioning water waste	74	-	48	217	-	205	-	126	670	670	-	-	-	495	-	-	-	29,671	96	-
2d.3.2	Process decommissioning chemical flush waste	1	-	30	176	-	235	-	89	530	530	-	-	-	319	-	-	-	34,039	60	-
2d.3.3	Small tool allowance	-	30	-	-	-	-	-	4	34	34	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	129	60	467	124	-	123	903	903	-	-	6,000	529	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	3,915	587	4,502	4,502	4,502	-	-	-	-	-	-	-	-	-
2d.3.6	Florida LLRW Inspection Fee	-	-	-	-	-	-	18	2	19	19	-	-	-	-	-	-	-	-	-	-
2d.3.7	Fixed Overhead	-	-	-	-	-	-	408	61	470	470	-	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	75	30	207	453	467	565	4,341	992	7,129	2,627	4,502	-	6,000	1,343	-	-	-	368,678	244	-
Period 2d Period-Dependent Costs																					
2d.4.1	Decon supplies	95	-	-	-	-	-	-	24	119	119	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	214	21	235	235	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	18	2	20	20	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	329	-	-	-	-	-	82	411	411	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,235	-	-	-	-	-	185	1,421	1,421	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	21	6	-	77	-	22	126	126	-	-	-	1,074	-	-	-	21,489	35	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	609	91	700	700	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	189	19	208	208	-	-	-	-	-	-	-	-	-	-

**Table C-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2d Period-Dependent Costs (continued)																						
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	232	23	256	-	256	-	-	-	-	-	-	-	-	-	-
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	205	31	235	235	-	-	-	-	-	-	-	-	-	-	-
2d.4.11	ISFSI Operating Costs	-	-	-	-	-	-	25	4	29	-	29	-	-	-	-	-	-	-	-	-	-
2d.4.12	NEI Fees	-	-	-	-	-	-	184	18	202	202	-	-	-	-	-	-	-	-	-	-	-
2d.4.13	Security Staff Cost	-	-	-	-	-	-	4,212	632	4,844	4,844	-	-	-	-	-	-	-	-	-	-	63,957
2d.4.14	DOC Staff Cost	-	-	-	-	-	-	3,169	475	3,644	3,644	-	-	-	-	-	-	-	-	-	-	38,586
2d.4.15	Utility Staff Cost	-	-	-	-	-	-	4,536	680	5,216	5,216	-	-	-	-	-	-	-	-	-	-	63,957
2d.4	Subtotal Period 2d Period-Dependent Costs	95	1,564	21	6	-	77	13,592	2,310	17,665	17,381	284	-	-	1,074	-	-	-	-	21,489	35	166,500
2d.0	TOTAL PERIOD 2d COST	1,312	2,507	473	722	1,140	2,119	19,578	5,130	32,981	28,195	4,786	-	20,063	8,976	-	-	-	-	1,220,411	41,687	172,740
<b>PERIOD 2f - License Termination</b>																						
Period 2f Direct Decommissioning Activities																						
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	165	49	214	214	-	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	165	49	214	214	-	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																						
2f.2.1	License Termination Survey	-	-	-	-	-	-	5,182	1,555	6,737	6,737	-	-	-	-	-	-	-	-	-	97,204	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	5,182	1,555	6,737	6,737	-	-	-	-	-	-	-	-	-	97,204	3,120
Period 2f Collateral Costs																						
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	884	133	1,016	-	1,016	-	-	-	-	-	-	-	-	-	-
2f.3.3	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	-	-
2f.3.4	Fixed Overhead	-	-	-	-	-	-	607	91	698	698	-	-	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	2,680	402	3,082	2,066	1,016	-	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																						
2f.4.1	Insurance	-	-	-	-	-	-	318	32	350	350	-	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	27	3	29	29	-	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	461	-	-	-	-	-	115	576	576	-	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	5	1	-	18	-	5	29	29	-	-	249	-	-	-	-	-	4,974	8	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	453	68	520	520	-	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	307	31	338	338	-	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	345	35	380	-	380	-	-	-	-	-	-	-	-	-	-
2f.4.8	ISFSI Operating Costs	-	-	-	-	-	-	37	6	42	-	42	-	-	-	-	-	-	-	-	-	-
2f.4.9	NEI Fees	-	-	-	-	-	-	273	27	300	300	-	-	-	-	-	-	-	-	-	-	-
2f.4.10	Security Staff Cost	-	-	-	-	-	-	1,555	233	1,788	1,788	-	-	-	-	-	-	-	-	-	-	33,000
2f.4.11	DOC Staff Cost	-	-	-	-	-	-	3,882	582	4,464	4,464	-	-	-	-	-	-	-	-	-	-	46,750
2f.4.12	Utility Staff Cost	-	-	-	-	-	-	4,952	743	5,695	5,695	-	-	-	-	-	-	-	-	-	-	60,107
2f.4	Subtotal Period 2f Period-Dependent Costs	-	461	5	1	-	18	12,148	1,879	14,513	14,090	422	-	249	-	-	-	-	-	4,974	8	139,857
2f.0	TOTAL PERIOD 2f COST	-	461	5	1	-	18	20,175	3,885	24,546	23,107	1,438	-	249	-	-	-	-	-	4,974	97,212	142,977
<b>PERIOD 2 TOTALS</b>		<b>8,548</b>	<b>59,005</b>	<b>23,224</b>	<b>19,164</b>	<b>9,804</b>	<b>55,563</b>	<b>268,115</b>	<b>88,643</b>	<b>532,065</b>	<b>455,665</b>	<b>67,616</b>	<b>8,784</b>	<b>149,691</b>	<b>1,125,049</b>	<b>505</b>	<b>393</b>	<b>-</b>	<b>114,320,200</b>	<b>967,691</b>	<b>2,397,818</b>	
<b>PERIOD 3b - Site Restoration</b>																						
Period 3b Direct Decommissioning Activities																						
Demolition of Remaining Site Buildings																						
3b.1.1.1	*Reactor	-	7,922	-	-	-	-	-	1,188	9,111	-	-	9,111	-	-	-	-	-	-	-	114,134	-
3b.1.1.2	Intake Structure & CWS	-	669	-	-	-	-	-	100	769	-	-	769	-	-	-	-	-	-	-	9,031	-
3b.1.1.3	Miscellaneous Structures	-	5,301	-	-	-	-	-	795	6,096	-	-	6,096	-	-	-	-	-	-	-	74,756	-
3b.1.1.4	Primary Water Tank & Pump - Contaminated	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	48	-
3b.1.1.5	Reactor Auxiliary	-	1,788	-	-	-	-	-	268	2,056	-	-	2,056	-	-	-	-	-	-	-	22,733	-
3b.1.1.6	Security Improvements	-	245	-	-	-	-	-	37	282	-	-	282	-	-	-	-	-	-	-	2,317	-
3b.1.1.7	Steam Generator Blowdown Treatment	-	535	-	-	-	-	-	80	615	-	-	615	-	-	-	-	-	-	-	7,492	-
3b.1.1.8	Turbine	-	1,098	-	-	-	-	-	165	1,263	-	-	1,263	-	-	-	-	-	-	-	17,649	-
3b.1.1.9	Turbine Pedestal	-	821	-	-	-	-	-	123	945	-	-	945	-	-	-	-	-	-	-	8,825	-
3b.1.1.10	Fuel Handling	-	1,054	-	-	-	-	-	158	1,212	-	-	1,212	-	-	-	-	-	-	-	14,207	-
3b.1.1	Totals	-	19,436	-	-	-	-	-	2,915	22,351	-	-	22,351	-	-	-	-	-	-	-	271,192	-

**Table C-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Site Closeout Activities																						
3b.1.2	Grade & landscape site	-	489	-	-	-	-	-	73	563	-	-	563	-	-	-	-	-	-	-	1,141	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	186	28	214	214	-	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	19,925	-	-	-	-	186	3,017	23,128	214	-	22,914	-	-	-	-	-	-	-	272,334	1,560
Period 3b Additional Costs																						
3b.2.1	Concrete Crushing	-	591	-	-	-	-	6	90	687	-	-	687	-	-	-	-	-	-	-	3,099	-
3b.2.2	Circulating Water Diffuser Isolation	-	161	-	-	-	-	-	24	185	-	-	185	-	-	-	-	-	-	-	2,151	-
3b.2.3	Intake and Discharge Cofferdams	-	638	-	-	-	-	-	96	734	-	-	734	-	-	-	-	-	-	-	5,926	-
3b.2.4	Construction Debris	-	-	-	-	-	-	831	125	956	-	-	956	-	-	-	-	-	-	-	-	-
3b.2	Subtotal Period 3b Additional Costs	-	1,391	-	-	-	-	837	334	2,562	-	-	2,562	-	-	-	-	-	-	-	11,176	-
Period 3b Collateral Costs																						
3b.3.1	Small tool allowance	-	210	-	-	-	-	-	32	242	-	-	242	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	210	-	-	-	-	-	32	242	-	-	242	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																						
3b.4.1	Insurance	-	-	-	-	-	-	849	85	934	0	439	495	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	66	7	73	-	73	-	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,265	-	-	-	-	-	940	7,204	-	-	7,204	-	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	561	84	645	-	-	645	-	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	346	35	381	-	381	-	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	857	86	942	-	942	-	-	-	-	-	-	-	-	-	-
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	91	14	105	-	105	-	-	-	-	-	-	-	-	-	-
3b.4.8	Security Staff Cost	-	-	-	-	-	-	3,857	579	4,435	0	3,326	1,109	-	-	-	-	-	-	-	-	81,840
3b.4.9	DOC Staff Cost	-	-	-	-	-	-	9,297	1,395	10,692	-	-	10,692	-	-	-	-	-	-	-	-	103,274
3b.4.10	Utility Staff Cost	-	-	-	-	-	-	5,397	809	6,206	(0)	1,179	5,027	-	-	-	-	-	-	-	-	65,784
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,265	-	-	-	-	21,321	4,032	31,618	0	6,446	25,172	-	-	-	-	-	-	-	-	250,898
3b.0	TOTAL PERIOD 3b COST	-	27,791	-	-	-	-	22,345	7,414	57,550	214	6,446	50,890	-	-	-	-	-	-	-	283,510	252,458
<b>PERIOD 3c - Fuel Storage Operations/Shipping</b>																						
Period 3c Direct Decommissioning Activities																						
Period 3c Collateral Costs																						
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	18,408	2,761	21,169	-	21,169	-	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	18,408	2,761	21,169	-	21,169	-	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																						
3c.4.1	Insurance	-	-	-	-	-	-	9,292	929	10,221	-	10,221	-	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	778	78	856	-	856	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	4,066	407	4,473	-	4,473	-	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	10,055	1,006	11,061	-	11,061	-	-	-	-	-	-	-	-	-	-
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,074	161	1,235	-	1,235	-	-	-	-	-	-	-	-	-	-
3c.4.7	Security Staff Cost	-	-	-	-	-	-	34,030	5,105	39,135	-	39,135	-	-	-	-	-	-	-	-	-	709,103
3c.4.8	Utility Staff Cost	-	-	-	-	-	-	12,353	1,853	14,206	-	14,206	-	-	-	-	-	-	-	-	-	154,630
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	71,649	9,538	81,187	-	81,187	-	-	-	-	-	-	-	-	-	863,733
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	90,057	12,299	102,356	-	102,356	-	-	-	-	-	-	-	-	-	863,733
<b>PERIOD 3d - GTCC shipping</b>																						
Period 3d Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	1,374	-	-	12,384	-	2,201	15,959	15,959	-	-	-	-	-	-	-	2,886	567,289	-	-
3d.1.1	Totals	-	-	1,374	-	-	12,384	-	2,201	15,959	15,959	-	-	-	-	-	-	-	2,886	567,289	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	1,374	-	-	12,384	-	2,201	15,959	15,959	-	-	-	-	-	-	-	2,886	567,289	-	-
Period 3d Collateral Costs																						
3d.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	6	1	6	-	6	-	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	6	1	6	-	6	-	-	-	-	-	-	-	-	-	-

**Table C-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 3d Period-Dependent Costs																						
3d.4.1	Insurance	-	-	-	-	-	-	17	2	19	-	19	-	-	-	-	-	-	-	-	-	
3d.4.2	Property taxes	-	-	-	-	-	-	1	0	1	-	1	-	-	-	-	-	-	-	-	-	
3d.4.4	Emergency Planning Fees	-	-	-	-	-	-	18	2	19	-	19	-	-	-	-	-	-	-	-	-	
3d.4.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-	
3d.4.6	Security Staff Cost	-	-	-	-	-	-	60	9	68	-	68	-	-	-	-	-	-	-	-	1,240	
3d.4.7	Utility Staff Cost	-	-	-	-	-	-	22	3	25	-	25	-	-	-	-	-	-	-	-	270	
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	119	16	135	-	135	-	-	-	-	-	-	-	-	1,510	
3d.0	TOTAL PERIOD 3d COST	-	-	1,374	-	-	12,384	125	2,218	16,101	15,959	142	-	-	-	-	-	2,886	567,289	-	1,510	
<b>PERIOD 3e - ISFSI Decontamination</b>																						
Period 3e Direct Decommissioning Activities																						
Period 3e Additional Costs																						
3e.2.1	Decommissioning of ISFSI	-	339	3	649	-	1,015	1,308	828	4,141	4,141	-	-	-	14,954	-	-	-	-	2,185,620	12,534	1,020
3e.2	Subtotal Period 3e Additional Costs	-	339	3	649	-	1,015	1,308	828	4,141	4,141	-	-	-	14,954	-	-	-	-	2,185,620	12,534	1,020
Period 3e Collateral Costs																						
3e.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	29	7	36	36	-	-	-	-	-	-	-	-	-	-	
3e.3	Subtotal Period 3e Collateral Costs	-	-	-	-	-	-	29	7	36	36	-	-	-	-	-	-	-	-	-	-	
Period 3e Period-Dependent Costs																						
3e.4.1	Insurance	-	-	-	-	-	-	68	17	85	85	-	-	-	-	-	-	-	-	-	-	
3e.4.2	Property taxes	-	-	-	-	-	-	12	3	15	15	-	-	-	-	-	-	-	-	-	-	
3e.4.3	Plant energy budget	-	-	-	-	-	-	100	25	124	124	-	-	-	-	-	-	-	-	-	-	
3e.4.4	Security Staff Cost	-	-	-	-	-	-	74	18	92	92	-	-	-	-	-	-	-	-	-	1,729	
3e.4.5	Utility Staff Cost	-	-	-	-	-	-	159	40	199	199	-	-	-	-	-	-	-	-	-	1,901	
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	412	103	515	515	-	-	-	-	-	-	-	-	-	3,630	
3e.0	TOTAL PERIOD 3e COST	-	339	3	649	-	1,015	1,749	939	4,693	4,693	-	-	-	14,954	-	-	-	-	2,185,620	12,534	4,650
<b>PERIOD 3f - ISFSI Site Restoration</b>																						
Period 3f Direct Decommissioning Activities																						
Period 3f Additional Costs																						
3f.2.1	Demolition of ISFSI	-	745	-	-	-	-	28	116	890	-	-	890	-	-	-	-	-	-	-	4,137	80
3f.2	Subtotal Period 3f Additional Costs	-	745	-	-	-	-	28	116	890	-	-	890	-	-	-	-	-	-	-	4,137	80
Period 3f Collateral Costs																						
3f.3.1	Small tool allowance	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																						
3f.4.2	Property taxes	-	-	-	-	-	-	6	1	7	-	-	7	-	-	-	-	-	-	-	-	
3f.4.3	Heavy equipment rental	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	-	-	
3f.4.4	Plant energy budget	-	-	-	-	-	-	50	8	58	-	-	58	-	-	-	-	-	-	-	-	
3f.4.5	Security Staff Cost	-	-	-	-	-	-	15	2	17	-	-	17	-	-	-	-	-	-	-	349	
3f.4.6	Utility Staff Cost	-	-	-	-	-	-	69	10	79	-	-	79	-	-	-	-	-	-	-	784	
3f.4	Subtotal Period 3f Period-Dependent Costs	-	14	-	-	-	-	140	23	177	-	-	177	-	-	-	-	-	-	-	1,133	
3f.0	TOTAL PERIOD 3f COST	-	765	-	-	-	-	168	140	1,074	-	-	1,074	-	-	-	-	-	-	-	4,137	1,213
<b>PERIOD 3 TOTALS</b>		-	28,895	1,377	649	-	13,399	114,444	23,010	181,773	20,866	108,943	51,963	-	14,954	-	-	2,886	2,752,909	300,181	1,123,564	
<b>TOTAL COST TO DECOMMISSION</b>		<b>11,685</b>	<b>90,704</b>	<b>25,377</b>	<b>20,513</b>	<b>14,968</b>	<b>72,240</b>	<b>503,130</b>	<b>133,215</b>	<b>871,831</b>	<b>619,088</b>	<b>190,515</b>	<b>62,228</b>	<b>176,708</b>	<b>1,141,086</b>	<b>1,231</b>	<b>393</b>	<b>2,886</b>	<b>118,581,000</b>	<b>1,305,177</b>	<b>4,553,773</b>	

**Table C-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			

<b>TOTAL COST TO DECOMMISSION WITH 18.04% CONTINGENCY:</b>					\$871,831	thousands of 2015 dollars															
<b>TOTAL NRC LICENSE TERMINATION COST IS 71.01% OR:</b>					\$619,088	thousands of 2015 dollars															
<b>SPENT FUEL MANAGEMENT COST IS 21.85% OR:</b>					\$190,515	thousands of 2015 dollars															
<b>NON-NUCLEAR DEMOLITION COST IS 7.14% OR:</b>					\$62,228	thousands of 2015 dollars															
<b>TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):</b>					1,142,710	cubic feet															
<b>TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:</b>					2,886	cubic feet															
<b>TOTAL SCRAP METAL REMOVED:</b>					44,793	tons															
<b>TOTAL CRAFT LABOR REQUIREMENTS:</b>					1,305,177	man-hours															

End Notes:  
n/a - indicates that this activity not charged as decommissioning expense.  
a - indicates that this activity performed by decommissioning staff.  
0 - indicates that this value is less than 0.5 but is non-zero.  
a cell containing " - " indicates a zero value

**APPENDIX D  
DETAILED COST ANALYSIS  
SAFSTOR**

**Tables**

D-1	St. Lucie Nuclear Plant, Unit 1.....	2
D-2	St. Lucie Nuclear Plant, Unit 2.....	13

Table D-1  
St. Lucie Nuclear Plant, Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
<b>PERIOD 1a - Shutdown through Transition</b>																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	408	122	530	530	-	-	-	-	-	-	-	-	-	
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	1,300	
1a.1.3	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
1a.1.4	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	
1a.1.5	Notification of Permanent Defueling	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
1a.1.6	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	239	36	275	275	-	-	-	-	-	-	-	-	2,000	
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	1,300	
1a.1.9	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	1,000	
1a.1.11	End product description	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	1,000	
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	179	27	206	206	-	-	-	-	-	-	-	-	1,500	
1a.1.13	Define major work sequence	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	1,000	
1a.1.14	Perform SER and EA	-	-	-	-	-	-	371	56	426	426	-	-	-	-	-	-	-	-	3,100	
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	598	90	687	687	-	-	-	-	-	-	-	-	5,000	
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	588	88	676	676	-	-	-	-	-	-	-	-	4,920	
1a.1.16.2	Plant systems	-	-	-	-	-	-	498	75	573	573	-	-	-	-	-	-	-	-	4,167	
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	373	56	429	429	-	-	-	-	-	-	-	-	3,120	
1a.1.16.4	Waste management	-	-	-	-	-	-	239	36	275	275	-	-	-	-	-	-	-	-	2,000	
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	239	36	275	275	-	-	-	-	-	-	-	-	2,000	
1a.1.16	Total	-	-	-	-	-	-	1,937	291	2,228	2,228	-	-	-	-	-	-	-	-	16,207	
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	141	21	163	163	-	-	-	-	-	-	-	-	1,183	
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	143	22	165	165	-	-	-	-	-	-	-	-	1,200	
1a.1.17	Total	-	-	-	-	-	-	285	43	328	328	-	-	-	-	-	-	-	-	2,383	
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	12	2	14	14	-	-	-	-	-	-	-	-	100	
1a.1.19	Drain/de-energize non-cont. systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
1a.1.20	Drain & dry NSSS	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
1a.1.21	Drain/de-energize contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
1a.1.22	Decon/secure contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	4,698	766	5,463	5,463	-	-	-	-	-	-	-	-	35,890	
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,620	993	7,613	-	7,613	-	-	-	-	-	-	-	-	
1a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	
1a.3.3	Fixed Overhead	-	-	-	-	-	-	806	121	927	927	-	-	-	-	-	-	-	-	-	
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	7,426	1,114	8,540	928	7,613	-	-	-	-	-	-	-	-	
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,147	115	1,262	1,262	-	-	-	-	-	-	-	-	-	
1a.4.2	Property taxes	-	-	-	-	-	-	859	86	945	945	-	-	-	-	-	-	-	-	-	
1a.4.3	Health physics supplies	-	369	-	-	-	-	-	92	462	462	-	-	-	-	-	-	-	-	-	
1a.4.4	Heavy equipment rental	-	658	-	-	-	-	-	99	757	757	-	-	-	-	-	-	-	-	-	
1a.4.5	Disposal of DAW generated	-	-	10	3	-	35	-	10	58	58	-	-	-	493	-	-	-	9,854	16	
1a.4.6	Plant energy budget	-	-	-	-	-	-	3,003	451	3,454	3,454	-	-	-	-	-	-	-	-	-	
1a.4.7	NRC Fees	-	-	-	-	-	-	1,156	116	1,272	1,272	-	-	-	-	-	-	-	-	-	
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	667	67	734	-	734	-	-	-	-	-	-	-	-	
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	797	120	917	-	917	-	-	-	-	-	-	-	-	
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	
1a.4.11	INPO Fees	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	
1a.4.12	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,191	1,079	8,269	8,269	-	-	-	-	-	-	-	-	147,043	
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	31,064	4,660	35,724	35,724	-	-	-	-	-	-	-	-	423,400	
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,028	10	3	-	35	47,136	7,020	55,232	53,525	1,707	-	-	493	-	-	-	9,854	16	570,443
1a.0	TOTAL PERIOD 1a COST	-	1,028	10	3	-	35	59,261	8,900	69,236	59,916	9,320	-	-	493	-	-	-	9,854	16	606,333

**Table D-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 1b - SAFSTOR Limited DECON Activities</b>																						
Period 1b Direct Decommissioning Activities																						
Decontamination of Site Buildings																						
1b.1.1.1	Reactor	1,061	-	-	-	-	-	-	530	1,591	1,591	-	-	-	-	-	-	-	-	-	22,339	-
1b.1.1.2	Reactor Auxiliary	485	-	-	-	-	-	-	243	728	728	-	-	-	-	-	-	-	-	-	10,511	-
1b.1.1.3	Fuel Handling	408	-	-	-	-	-	-	204	611	611	-	-	-	-	-	-	-	-	-	7,946	-
1b.1.1	Totals	1,953	-	-	-	-	-	-	977	2,930	2,930	-	-	-	-	-	-	-	-	-	40,796	-
1b.1	Subtotal Period 1b Activity Costs	1,953	-	-	-	-	-	-	977	2,930	2,930	-	-	-	-	-	-	-	-	-	40,796	-
Period 1b Collateral Costs																						
1b.3.1	Decon equipment	860	-	-	-	-	-	-	129	989	989	-	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	160	-	98	444	-	418	-	261	1,381	1,381	-	-	-	1,009	-	-	-	-	-	60,563	197
1b.3.4	Small tool allowance	-	29	-	-	-	-	-	4	34	34	-	-	-	-	-	-	-	-	-	-	-
1b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-	-
1b.3.6	Fixed Overhead	-	-	-	-	-	-	203	30	234	234	-	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,020	29	98	444	-	418	206	425	2,641	2,641	-	-	-	1,009	-	-	-	-	-	60,563	197
Period 1b Period-Dependent Costs																						
1b.4.1	Decon supplies	719	-	-	-	-	-	-	180	899	899	-	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	288	29	316	316	-	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	217	22	238	238	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	272	-	-	-	-	-	68	340	340	-	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	166	-	-	-	-	-	25	191	191	-	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	10	3	-	38	-	11	62	62	-	-	-	532	-	-	-	-	-	10,632	17
1b.4.7	Plant energy budget	-	-	-	-	-	-	757	114	871	871	-	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	173	17	190	190	-	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	168	17	185	-	185	-	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	201	30	231	-	231	-	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-	-
1b.4.12	NEI Fees	-	-	-	-	-	-	91	9	100	100	-	-	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,812	272	2,084	2,084	-	-	-	-	-	-	-	-	-	-	37,063
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,830	1,174	9,004	9,004	-	-	-	-	-	-	-	-	-	-	106,720
1b.4	Subtotal Period 1b Period-Dependent Costs	719	438	10	3	-	38	11,549	1,969	14,727	14,297	430	-	-	532	-	-	-	-	-	10,632	17
1b.0	TOTAL PERIOD 1b COST	3,692	468	108	447	-	456	11,755	3,371	20,297	19,867	430	-	-	1,541	-	-	-	-	-	71,195	41,010
<b>PERIOD 1c - Preparations for SAFSTOR Dormancy</b>																						
Period 1c Direct Decommissioning Activities																						
1c.1.1	Prepare support equipment for storage	-	435	-	-	-	-	-	65	501	501	-	-	-	-	-	-	-	-	-	-	3,000
1c.1.2	Install containment pressure equal. lines	-	36	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	-	-	700
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	-	-	13,040
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	70	10	80	80	-	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	471	-	-	-	-	803	301	1,575	1,575	-	-	-	-	-	-	-	-	-	-	16,740
Period 1c Additional Costs																						
1c.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,087	1,663	12,750	12,750	-	-	-	-	-	-	-	-	-	-	-
1c.2	Subtotal Period 1c Additional Costs	-	-	-	-	-	-	11,087	1,663	12,750	12,750	-	-	-	-	-	-	-	-	-	-	-
Period 1c Collateral Costs																						
1c.3.1	Process decommissioning water waste	194	-	119	541	-	510	-	318	1,683	1,683	-	-	-	1,230	-	-	-	-	-	73,824	240
1c.3.3	Small tool allowance	-	3	-	-	-	-	-	0	4	4	-	-	-	-	-	-	-	-	-	-	-
1c.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-	-
1c.3.5	Fixed Overhead	-	-	-	-	-	-	205	31	236	236	-	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	194	3	119	541	-	510	208	349	1,925	1,925	-	-	-	1,230	-	-	-	-	-	73,824	240
Period 1c Period-Dependent Costs																						
1c.4.1	Insurance	-	-	-	-	-	-	290	29	318	318	-	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	219	22	241	241	-	-	-	-	-	-	-	-	-	-	-

**Table D-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
Period 1c Period-Dependent Costs (continued)																					
1c.4.3	Health physics supplies	-	168	-	-	-	-	-	42	210	210	-	-	-	-	-	-	-	-	-	
1c.4.4	Heavy equipment rental	-	168	-	-	-	-	-	25	193	193	-	-	-	-	-	-	-	-	-	
1c.4.5	Disposal of DAW generated	-	-	2	1	-	9	-	3	15	15	-	-	-	126	-	-	-	2,511	4	
1c.4.6	Plant energy budget	-	-	-	-	-	-	765	115	880	880	-	-	-	-	-	-	-	-	-	
1c.4.7	NRC Fees	-	-	-	-	-	-	175	17	192	192	-	-	-	-	-	-	-	-	-	
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	170	17	187	-	187	-	-	-	-	-	-	-	-	
1c.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	203	30	234	-	234	-	-	-	-	-	-	-	-	
1c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	
1c.4.11	NEI Fees	-	-	-	-	-	-	92	9	102	102	-	-	-	-	-	-	-	-	-	
1c.4.12	Security Staff Cost	-	-	-	-	-	-	1,832	275	2,107	2,107	-	-	-	-	-	-	-	-	37,466	
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	7,915	1,187	9,102	9,102	-	-	-	-	-	-	-	-	107,880	
1c.4	Subtotal Period 1c Period-Dependent Costs	-	336	2	1	-	9	11,673	1,774	13,795	13,360	435	-	-	126	-	-	-	2,511	4	145,346
1c.0	TOTAL PERIOD 1c COST	194	811	122	542	-	519	23,771	4,087	30,045	29,610	435	-	-	1,356	-	-	-	76,334	16,984	145,929
<b>PERIOD 1 TOTALS</b>		<b>3,886</b>	<b>2,306</b>	<b>240</b>	<b>992</b>	<b>-</b>	<b>1,010</b>	<b>94,786</b>	<b>16,358</b>	<b>119,578</b>	<b>109,393</b>	<b>10,185</b>	<b>-</b>	<b>-</b>	<b>3,390</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>157,384</b>	<b>58,010</b>	<b>896,045</b>
<b>PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage</b>																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2a.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2a.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	4	1	5	5	-	-	-	-	-	-	-	-	-	
2a.1.5	Maintenance supplies	-	-	-	-	-	-	559	140	699	699	-	-	-	-	-	-	-	-	-	
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	563	140	704	704	-	-	-	-	-	-	-	-	-	
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	53,537	8,031	61,567	-	61,567	-	-	-	-	-	-	-	-	
2a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	
2a.3.3	Fixed Overhead	-	-	-	-	-	-	3,221	483	3,704	3,704	-	-	-	-	-	-	-	-	-	
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	56,759	8,514	65,273	3,706	61,567	-	-	-	-	-	-	-	-	
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,726	173	1,898	1,855	43	-	-	-	-	-	-	-	-	
2a.4.2	Property taxes	-	-	-	-	-	-	3,435	343	3,778	3,778	-	-	-	-	-	-	-	-	-	
2a.4.3	Health physics supplies	-	552	-	-	-	-	-	138	690	690	-	-	-	-	-	-	-	-	-	
2a.4.4	Disposal of DAW generated	-	-	13	4	-	49	-	14	81	81	-	-	-	686	-	-	-	13,725	22	
2a.4.5	Plant energy budget	-	-	-	-	-	-	2,401	360	2,761	1,381	1,381	-	-	-	-	-	-	-	-	
2a.4.6	NRC Fees	-	-	-	-	-	-	1,198	120	1,318	1,318	-	-	-	-	-	-	-	-	-	
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,832	183	2,016	-	2,016	-	-	-	-	-	-	-	-	
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	3,187	478	3,665	-	3,665	-	-	-	-	-	-	-	-	
2a.4.9	ISFSI Operating Costs	-	-	-	-	-	-	196	29	225	-	225	-	-	-	-	-	-	-	-	
2a.4.10	NEI Fees	-	-	-	-	-	-	1,448	145	1,593	-	1,593	-	-	-	-	-	-	-	-	
2a.4.11	Security Staff Cost	-	-	-	-	-	-	18,693	2,804	21,497	3,374	18,123	-	-	-	-	-	-	-	358,497	
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	25,747	3,862	29,609	4,287	25,322	-	-	-	-	-	-	-	329,317	
2a.4	Subtotal Period 2a Period-Dependent Costs	-	552	13	4	-	49	59,864	8,650	69,132	16,764	52,368	-	-	686	-	-	-	13,725	22	687,814
2a.0	TOTAL PERIOD 2a COST	-	552	13	4	-	49	117,186	17,304	135,109	21,173	113,936	-	-	686	-	-	-	13,725	22	687,814
<b>PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage</b>																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2b.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2b.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	34	5	39	39	-	-	-	-	-	-	-	-	-	
2b.1.5	Maintenance supplies	-	-	-	-	-	-	4,527	1,132	5,658	5,658	-	-	-	-	-	-	-	-	-	
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	4,560	1,137	5,697	5,697	-	-	-	-	-	-	-	-	-	
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	51,617	7,742	59,359	-	59,359	-	-	-	-	-	-	-	-	
2b.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	5	0	5	5	-	-	-	-	-	-	-	-	-	
2b.3.3	Fixed Overhead	-	-	-	-	-	-	5,215	782	5,997	5,997	-	-	-	-	-	-	-	-	-	

**Table D-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	56,836	8,525	65,361	6,002	59,359	-	-	-	-	-	-	-	-	
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	13,651	1,365	15,016	15,016	0	-	-	-	-	-	-	-	-	
2b.4.2	Property taxes	-	-	-	-	-	-	3,073	307	3,381	1,263	2,118	-	-	-	-	-	-	-	-	
2b.4.3	Health physics supplies	-	2,005	-	-	-	-	-	501	2,506	2,506	-	-	-	-	-	-	-	-	-	
2b.4.4	Disposal of DAW generated	-	-	47	14	-	172	-	50	283	283	-	-	-	2,409	-	-	-	48,182	79	
2b.4.5	Plant energy budget	-	-	-	-	-	-	9,718	1,458	11,176	11,176	-	-	-	-	-	-	-	-	-	
2b.4.6	NRC Fees	-	-	-	-	-	-	9,284	928	10,212	10,212	-	-	-	-	-	-	-	-	-	
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	14,833	1,483	16,316	-	16,316	-	-	-	-	-	-	-	-	
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	1,584	238	1,821	-	1,821	-	-	-	-	-	-	-	-	
2b.4.9	Security Staff Cost	-	-	-	-	-	-	66,785	10,018	76,803	27,311	49,492	-	-	-	-	-	-	-	1,417,200	
2b.4.10	Utility Staff Cost	-	-	-	-	-	-	51,905	7,786	59,691	34,701	24,990	-	-	-	-	-	-	-	695,103	
2b.4	Subtotal Period 2b Period-Dependent Costs	-	2,005	47	14	-	172	170,833	24,134	197,204	102,467	94,737	-	-	2,409	-	-	-	48,182	79	2,112,303
2b.0	TOTAL PERIOD 2b COST	-	2,005	47	14	-	172	232,229	33,796	268,262	114,166	154,096	-	-	2,409	-	-	-	48,182	79	2,112,303
<b>PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage</b>																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2c.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2c.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	16	2	18	18	-	-	-	-	-	-	-	-	-	
2c.1.5	Maintenance supplies	-	-	-	-	-	-	2,112	528	2,640	2,640	-	-	-	-	-	-	-	-	-	
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	2,128	530	2,658	2,658	-	-	-	-	-	-	-	-	-	
Period 2c Collateral Costs																					
2c.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	2	0	2	2	-	-	-	-	-	-	-	-	-	
2c.3.2	Fixed Overhead	-	-	-	-	-	-	2,433	365	2,798	2,798	-	-	-	-	-	-	-	-	-	
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	2,435	365	2,801	2,801	-	-	-	-	-	-	-	-	-	
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	6,370	637	7,007	7,007	-	-	-	-	-	-	-	-	-	
2c.4.2	Property taxes	-	-	-	-	-	-	536	54	589	589	-	-	-	-	-	-	-	-	-	
2c.4.3	Health physics supplies	-	891	-	-	-	-	-	223	1,114	1,114	-	-	-	-	-	-	-	-	-	
2c.4.4	Disposal of DAW generated	-	-	21	6	-	75	-	22	124	124	-	-	-	1,053	-	-	-	21,058	34	
2c.4.5	Plant energy budget	-	-	-	-	-	-	4,535	680	5,215	5,215	-	-	-	-	-	-	-	-	-	
2c.4.6	NRC Fees	-	-	-	-	-	-	4,009	401	4,409	4,409	-	-	-	-	-	-	-	-	-	
2c.4.7	Security Staff Cost	-	-	-	-	-	-	11,082	1,662	12,744	12,744	-	-	-	-	-	-	-	-	236,186	
2c.4.8	Utility Staff Cost	-	-	-	-	-	-	14,081	2,112	16,193	16,193	-	-	-	-	-	-	-	-	200,915	
2c.4	Subtotal Period 2c Period-Dependent Costs	-	891	21	6	-	75	40,612	5,791	47,395	47,395	-	-	-	1,053	-	-	-	21,058	34	437,101
2c.0	TOTAL PERIOD 2c COST	-	891	21	6	-	75	45,175	6,686	52,854	52,854	-	-	-	1,053	-	-	-	21,058	34	437,101
<b>PERIOD 2 TOTALS</b>																					
		-	3,448	81	25	-	295	394,590	57,786	456,226	188,194	268,032	-	-	4,148	-	-	-	82,965	135	3,237,218
<b>PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy</b>																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	1,300	
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	550	82	632	632	-	-	-	-	-	-	-	-	4,600	
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
3a.1.4	End product description	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	1,000	
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	155	23	179	179	-	-	-	-	-	-	-	-	1,300	
3a.1.6	Define major work sequence	-	-	-	-	-	-	896	134	1,031	1,031	-	-	-	-	-	-	-	-	7,500	
3a.1.7	Perform SER and EA	-	-	-	-	-	-	371	56	426	426	-	-	-	-	-	-	-	-	3,100	
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	598	90	687	687	-	-	-	-	-	-	-	-	5,000	
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	490	73	563	563	-	-	-	-	-	-	-	-	4,096	
3a.1.10	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	881	132	1,013	912	-	101	-	-	-	-	-	-	7,370	
3a.1.11.2	Plant systems	-	-	-	-	-	-	498	75	573	515	-	57	-	-	-	-	-	-	4,167	
3a.1.11.3	Reactor internals	-	-	-	-	-	-	849	127	976	976	-	-	-	-	-	-	-	-	7,100	

Table D-1  
St. Lucie Nuclear Plant, Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/ Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Activity Specifications (continued)																						
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	777	117	893	893	-	-	-	-	-	-	-	-	-	6,500	
3a.1.11.5	Biological shield	-	-	-	-	-	-	60	9	69	69	-	-	-	-	-	-	-	-	-	500	
3a.1.11.6	Steam generators	-	-	-	-	-	-	373	56	429	429	-	-	-	-	-	-	-	-	-	3,120	
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	191	29	220	110	-	110	-	-	-	-	-	-	-	1,600	
3a.1.11.8	Main Turbine	-	-	-	-	-	-	48	7	55	-	-	55	-	-	-	-	-	-	-	400	
3a.1.11.9	Main Condensers	-	-	-	-	-	-	48	7	55	-	-	55	-	-	-	-	-	-	-	400	
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	373	56	429	214	-	214	-	-	-	-	-	-	-	3,120	
3a.1.11.11	Waste management	-	-	-	-	-	-	550	82	632	632	-	-	-	-	-	-	-	-	-	4,600	
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	108	16	124	62	-	62	-	-	-	-	-	-	-	900	
3a.1.11	Total	-	-	-	-	-	-	4,754	713	5,467	4,812	-	655	-	-	-	-	-	-	-	39,777	
Planning & Site Preparations																						
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	287	43	330	330	-	-	-	-	-	-	-	-	-	2,400	
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	3,100	465	3,565	3,565	-	-	-	-	-	-	-	-	-	-	
3a.1.14	Design water clean-up system	-	-	-	-	-	-	167	25	192	192	-	-	-	-	-	-	-	-	-	1,400	
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-	
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	147	22	169	169	-	-	-	-	-	-	-	-	-	1,230	
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	14,089	2,113	16,203	15,548	-	655	-	-	-	-	-	-	-	72,703	
Period 3a Additional Costs																						
3a.2.1	Site Characterization	-	-	-	-	-	-	5,740	1,722	7,463	7,463	-	-	-	-	-	-	-	-	-	30,500	
3a.2	Subtotal Period 3a Additional Costs	-	-	-	-	-	-	5,740	1,722	7,463	7,463	-	-	-	-	-	-	-	-	-	30,500	
Period 3a Collateral Costs																						
3a.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	
3a.3.2	Fixed Overhead	-	-	-	-	-	-	806	121	927	927	-	-	-	-	-	-	-	-	-	-	
3a.3	Subtotal Period 3a Collateral Costs	-	-	-	-	-	-	807	121	928	928	-	-	-	-	-	-	-	-	-	-	
Period 3a Period-Dependent Costs																						
3a.4.1	Insurance	-	-	-	-	-	-	422	42	464	464	-	-	-	-	-	-	-	-	-	-	
3a.4.2	Property taxes	-	-	-	-	-	-	35	4	39	39	-	-	-	-	-	-	-	-	-	-	
3a.4.3	Health physics supplies	-	310	-	-	-	-	-	78	388	388	-	-	-	-	-	-	-	-	-	-	
3a.4.4	Heavy equipment rental	-	658	-	-	-	-	-	99	757	757	-	-	-	-	-	-	-	-	-	-	
3a.4.5	Disposal of DAW generated	-	-	8	2	-	28	-	8	47	47	-	-	-	-	-	-	-	-	-	-	
3a.4.6	Plant energy budget	-	-	-	-	-	-	3,003	451	3,454	3,454	-	-	-	-	-	-	-	-	-	-	
3a.4.7	NRC Fees	-	-	-	-	-	-	385	38	423	423	-	-	-	-	-	-	-	-	-	-	
3a.4.8	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-	
3a.4.9	Security Staff Cost	-	-	-	-	-	-	1,428	214	1,642	1,642	-	-	-	-	-	-	-	-	-	37,814	
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	19,492	2,924	22,416	22,416	-	-	-	-	-	-	-	-	-	258,629	
3a.4	Subtotal Period 3a Period-Dependent Costs	-	968	8	2	-	28	25,128	3,893	30,029	30,029	-	-	-	398	-	-	-	-	7,951	13	296,443
3a.0	TOTAL PERIOD 3a COST	-	968	8	2	-	28	45,765	7,850	54,622	53,967	-	655	-	398	-	-	-	-	7,951	30,513	379,997
<b>PERIOD 3b - Decommissioning Preparations</b>																						
Period 3b Direct Decommissioning Activities																						
Detailed Work Procedures																						
3b.1.1.1	Plant systems	-	-	-	-	-	-	566	85	651	585	-	65	-	-	-	-	-	-	-	4,733	
3b.1.1.2	Reactor internals	-	-	-	-	-	-	299	45	344	344	-	-	-	-	-	-	-	-	-	2,500	
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	161	24	186	46	-	139	-	-	-	-	-	-	-	1,350	
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000	
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000	
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	120	18	137	137	-	-	-	-	-	-	-	-	-	1,000	
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	434	65	499	499	-	-	-	-	-	-	-	-	-	3,630	
3b.1.1.8	Facility closeout	-	-	-	-	-	-	143	22	165	82	-	82	-	-	-	-	-	-	-	1,200	
3b.1.1.9	Missile shields	-	-	-	-	-	-	54	8	62	62	-	-	-	-	-	-	-	-	-	450	
3b.1.1.10	Biological shield	-	-	-	-	-	-	143	22	165	165	-	-	-	-	-	-	-	-	-	1,200	
3b.1.1.11	Steam generators	-	-	-	-	-	-	550	82	632	632	-	-	-	-	-	-	-	-	-	4,600	
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	120	18	137	69	-	69	-	-	-	-	-	-	-	1,000	
3b.1.1.13	Main Turbine	-	-	-	-	-	-	186	28	214	-	-	214	-	-	-	-	-	-	-	1,560	
3b.1.1.14	Main Condensers	-	-	-	-	-	-	186	28	214	-	-	214	-	-	-	-	-	-	-	1,560	
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	326	49	375	338	-	38	-	-	-	-	-	-	-	2,730	
3b.1.1.16	Reactor building	-	-	-	-	-	-	326	49	375	338	-	38	-	-	-	-	-	-	-	2,730	
3b.1.1	Total	-	-	-	-	-	-	3,854	578	4,432	3,572	-	859	-	-	-	-	-	-	-	32,243	

**Table D-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,854	578	4,432	3,572	-	859	-	-	-	-	-	-	-	-	32,243
Period 3b Additional Costs																						
3b.2.1	Asbestos Remediation	-	3,179	2	231	-	1,272	-	1,148	5,831	5,831	-	-	-	13,743	-	-	-	-	178,659	37,094	-
3b.2.2	Misc Hazardous Waste	-	-	665	169	5,164	-	-	866	6,863	6,863	-	-	27,017	-	-	-	-	-	1,397,259	5,520	-
3b.2	Subtotal Period 3b Additional Costs	-	3,179	667	400	5,164	1,272	-	2,014	12,695	12,695	-	-	27,017	13,743	-	-	-	-	1,575,918	42,614	-
Period 3b Collateral Costs																						
3b.3.1	Decon equipment	860	-	-	-	-	-	-	129	989	989	-	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-	-
3b.3.3	Small tool allowance	-	33	-	-	-	-	-	5	38	38	-	-	-	-	-	-	-	-	-	-	-
3b.3.4	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-	-
3b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	27	3	30	30	-	-	-	-	-	-	-	-	-	-	-
3b.3.6	Fixed Overhead	-	-	-	-	-	-	408	61	470	470	-	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	860	1,233	-	-	-	-	1,624	556	4,273	4,273	-	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																						
3b.4.1	Decon supplies	27	-	-	-	-	-	-	7	33	33	-	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	214	21	235	235	-	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	18	2	20	20	-	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	365	-	-	-	-	-	91	456	456	-	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	334	-	-	-	-	-	50	384	384	-	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	5	1	-	17	-	5	28	28	-	-	-	236	-	-	-	-	4,714	8	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	1,522	228	1,751	1,751	-	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	195	20	215	215	-	-	-	-	-	-	-	-	-	-	-
3b.4.9	NEI Fees	-	-	-	-	-	-	184	18	202	202	-	-	-	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	724	109	832	832	-	-	-	-	-	-	-	-	-	-	19,166
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	5,024	754	5,777	5,777	-	-	-	-	-	-	-	-	-	-	59,200
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	9,880	1,482	11,362	11,362	-	-	-	-	-	-	-	-	-	-	131,086
3b.4	Subtotal Period 3b Period-Dependent Costs	27	698	5	1	-	17	17,760	2,786	21,294	21,294	-	-	-	236	-	-	-	-	4,714	8	209,452
3b.0	TOTAL PERIOD 3b COST	887	5,110	671	401	5,164	1,289	23,238	5,934	42,694	41,835	-	859	27,017	13,979	-	-	-	-	1,580,632	42,621	241,695
<b>PERIOD 3 TOTALS</b>		<b>887</b>	<b>6,079</b>	<b>679</b>	<b>404</b>	<b>5,164</b>	<b>1,317</b>	<b>69,003</b>	<b>13,784</b>	<b>97,316</b>	<b>95,801</b>	<b>-</b>	<b>1,514</b>	<b>27,017</b>	<b>14,376</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,588,583</b>	<b>73,134</b>	<b>621,692</b>
<b>PERIOD 4a - Large Component Removal</b>																						
Period 4a Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
4a.1.1.1	Reactor Coolant Piping	12	45	9	12	45	101	-	52	276	276	-	-	234	247	-	-	-	-	54,216	1,227	-
4a.1.1.2	Pressurizer Relief Tank	1	5	2	2	8	15	-	7	41	41	-	-	39	39	-	-	-	-	8,699	142	-
4a.1.1.3	Reactor Coolant Pumps & Motors	34	77	60	147	-	2,140	-	599	3,058	3,058	-	-	-	6,541	-	-	-	-	564,000	3,039	80
4a.1.1.4	Pressurizer	8	51	357	104	-	1,098	-	343	1,961	1,961	-	-	-	3,358	-	-	-	-	238,456	1,508	750
4a.1.1.5	Steam Generators	39	3,338	1,600	3,867	1,633	4,706	-	3,015	18,198	18,198	-	-	30,926	14,387	-	-	-	-	2,498,110	10,254	2,250
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	32	260	270	97	48	533	-	263	1,504	1,504	-	-	753	3,309	-	-	-	-	177,734	6,112	-
4a.1.1.7	Reactor Vessel Internals	47	2,542	10,160	946	-	5,447	245	7,467	26,853	26,853	-	-	-	1,460	751	393	-	-	259,737	21,667	999
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	13,243	-	1,986	15,229	15,229	-	-	-	-	-	-	2,886	-	567,289	-	-
4a.1.1.9	Reactor Vessel	-	4,619	1,527	624	-	3,180	245	5,629	15,824	15,824	-	-	-	9,722	-	-	-	-	988,754	21,667	999
4a.1.1	Totals	173	10,939	13,985	5,799	1,733	30,463	490	19,362	82,944	82,944	-	-	31,952	39,062	751	393	2,886	-	5,356,993	65,616	5,077
Removal of Major Equipment																						
4a.1.2	Main Turbine/Generator	-	302	112	35	445	-	-	159	1,052	1,052	-	-	5,716	-	-	-	-	-	257,205	6,395	-
4a.1.3	Main Condensers	-	935	128	40	509	-	-	329	1,941	1,941	-	-	6,545	-	-	-	-	-	294,503	20,075	-
Cascading Costs from Clean Building Demolition																						
4a.1.4.1	Reactor	-	1,378	-	-	-	-	-	207	1,585	1,585	-	-	-	-	-	-	-	-	-	-	19,868
4a.1.4.2	Reactor Auxiliary	-	198	-	-	-	-	-	30	228	228	-	-	-	-	-	-	-	-	-	-	2,515
4a.1.4.3	Fuel Handling	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	-	-	1,519
4a.1.4	Totals	-	1,691	-	-	-	-	-	254	1,944	1,944	-	-	-	-	-	-	-	-	-	-	23,903
Disposal of Plant Systems																						
4a.1.5.1	Air Evacuation	-	7	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	-	-	171
4a.1.5.2	Air Evacuation - Insulated	-	29	-	-	-	-	-	4	34	-	-	34	-	-	-	-	-	-	-	-	701
4a.1.5.3	Auxiliary Steam - Insulated	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	-	-	577
4a.1.5.4	Chemical & Volume Control	-	95	13	20	44	136	-	69	378	378	-	-	629	592	-	-	-	-	63,654	1,969	-

Table D-1  
St. Lucie Nuclear Plant, Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
Disposal of Plant Systems (continued)																					
4a.1.5.5	Chemical & Volume Control - Insulated	-	403	52	56	5	445	-	226	1,187	1,187	-	-	67	1,885	-	-	-	127,813	7,484	-
4a.1.5.6	Chemical Feed	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	66	-
4a.1.5.7	Chemical Feed - Insulated	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	28	-
4a.1.5.8	Circulating & Intake Cooling Water	-	247	-	-	-	-	-	37	284	-	-	284	-	-	-	-	-	-	5,958	-
4a.1.5.9	Component Cooling	-	76	-	-	-	-	-	11	88	-	-	88	-	-	-	-	-	-	1,825	-
4a.1.5.10	Component Cooling - RCA	-	278	49	87	399	451	-	260	1,525	1,525	-	-	5,677	1,916	-	-	-	357,322	5,585	-
4a.1.5.11	Condensate	-	160	-	-	-	-	-	24	184	-	-	184	-	-	-	-	-	-	3,749	-
4a.1.5.12	Condensate - Insulated	-	90	-	-	-	-	-	14	104	-	-	104	-	-	-	-	-	-	2,214	-
4a.1.5.13	Condensate Polish Filter Demin	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	569	-
4a.1.5.14	Condensate Polish Filter Demin - Ins	-	72	-	-	-	-	-	11	83	-	-	83	-	-	-	-	-	-	1,778	-
4a.1.5.15	Condensate Recovery	-	3	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	86	-
4a.1.5.16	Condensate Recovery - Insulated	-	0	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	12	-
4a.1.5.17	Condensate Recovery - Insulated - RCA	-	1	0	0	0	1	-	0	2	2	-	-	1	2	-	-	-	209	11	-
4a.1.5.18	Condensate Recovery - RCA	-	11	1	1	9	6	-	6	34	34	-	-	131	26	-	-	-	7,011	210	-
4a.1.5.19	Condenser Tube Cleaning	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	838	-
4a.1.5.20	Demineralized Makeup Water	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	370	-
4a.1.5.21	Demineralized Makeup Water - RCA	-	12	2	2	2	12	-	7	37	37	-	-	32	52	-	-	-	4,768	210	-
4a.1.5.22	Domestic/Makeup/Service Water	-	183	-	-	-	-	-	27	210	-	-	210	-	-	-	-	-	-	4,067	-
4a.1.5.23	Domestic/Makeup/Service Water - RCA	-	91	10	15	41	92	-	55	304	304	-	-	583	391	-	-	-	49,597	1,713	-
4a.1.5.24	Domestic/Makeup/Service Water-Ins	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	93	-
4a.1.5.25	Domestic/Makeup/Service Water-Ins-RCA	-	11	1	2	4	10	-	6	35	35	-	-	63	44	-	-	-	5,486	206	-
4a.1.5.26	Electrical - Clean	-	2,035	-	-	-	-	-	305	2,340	-	-	2,340	-	-	-	-	-	-	46,406	-
4a.1.5.27	Extraction Steam	-	83	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	1,884	-
4a.1.5.28	Extraction Steam - Insulated	-	83	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	2,032	-
4a.1.5.29	Feedwater - Insulated	-	89	-	-	-	-	-	13	102	-	-	102	-	-	-	-	-	-	2,153	-
4a.1.5.30	Feedwater - Insulated - RCA	-	28	4	7	32	34	-	22	126	126	-	-	455	143	-	-	-	27,959	566	-
4a.1.5.31	Fire Protection	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,710	-
4a.1.5.32	Fire Protection - Insulated	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	163	-
4a.1.5.33	HVAC	-	74	-	-	-	-	-	11	85	-	-	85	-	-	-	-	-	-	1,898	-
4a.1.5.34	Heater Drain & Vent - Insulated	-	186	-	-	-	-	-	28	214	-	-	214	-	-	-	-	-	-	4,490	-
4a.1.5.35	Hydrogen Sampling	-	39	4	6	26	32	-	23	130	130	-	-	367	137	-	-	-	23,994	817	-
4a.1.5.36	Integrated Leak Rate Testing	-	27	2	4	13	22	-	15	83	83	-	-	179	93	-	-	-	13,407	532	-
4a.1.5.37	Main Steam - Insulated	-	193	-	-	-	-	-	29	222	-	-	222	-	-	-	-	-	-	4,624	-
4a.1.5.38	Main Steam - Insulated - RCA	-	41	6	10	48	50	-	32	188	188	-	-	688	214	-	-	-	42,107	812	-
4a.1.5.39	Misc Bulk Gas	-	17	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	440	-
4a.1.5.40	Misc Bulk Gas - RCA	-	13	2	2	2	13	-	7	38	38	-	-	23	53	-	-	-	4,467	231	-
4a.1.5.41	Miscellaneous	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	230	-
4a.1.5.42	Miscellaneous - RCA	-	9	2	5	26	21	-	12	75	75	-	-	365	90	-	-	-	20,772	190	-
4a.1.5.43	Neutralization Basin Recirculation	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	435	-
4a.1.5.44	Post Accident Sampling	-	14	1	2	8	8	-	7	41	41	-	-	117	36	-	-	-	7,143	311	-
4a.1.5.45	Post Accident Sampling - Insulated	-	40	2	2	2	18	-	15	79	79	-	-	22	76	-	-	-	5,929	858	-
4a.1.5.46	RCP Oil Collection	-	1	0	0	1	2	-	1	5	5	-	-	10	7	-	-	-	869	26	-
4a.1.5.47	SGBTF Blowdown - Insulated	-	25	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	642	-
4a.1.5.48	SGBTF HVAC	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,549	-
4a.1.5.49	SGBTF Misc - RCA	-	2	0	1	5	4	-	3	16	16	-	-	77	18	-	-	-	4,357	49	-
4a.1.5.50	SGBTF Waste Management	-	4	1	1	1	4	-	2	12	12	-	-	8	17	-	-	-	1,410	78	-
4a.1.5.51	SGBTF Waste Management - Insulated	-	42	5	5	5	37	-	22	115	115	-	-	72	155	-	-	-	13,208	742	-
4a.1.5.52	Safety Injection	-	181	67	99	254	637	-	264	1,501	1,501	-	-	3,611	2,714	-	-	-	325,534	3,853	-
4a.1.5.53	Safety Injection - Insulated	-	474	65	81	120	576	-	299	1,615	1,615	-	-	1,705	2,439	-	-	-	230,923	9,141	-
4a.1.5.54	Sampling	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	198	-
4a.1.5.55	Sampling - Insulated	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	188	-
4a.1.5.56	Sampling - Insulated - RCA	-	18	2	2	2	14	-	9	47	47	-	-	24	61	-	-	-	5,003	337	-
4a.1.5.57	Sampling - RCA	-	18	2	2	5	12	-	9	47	47	-	-	77	49	-	-	-	6,426	351	-
4a.1.5.58	Secondary Side Wet Layup	-	11	-	-	-	-	-	2	13	-	-	13	-	-	-	-	-	-	288	-
4a.1.5.59	Secondary Side Wet Layup - Ins	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	348	-
4a.1.5.60	Service & Instrument Air	-	26	-	-	-	-	-	4	30	-	-	30	-	-	-	-	-	-	617	-
4a.1.5.61	Service & Instrument Air - Ins	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	349	-
4a.1.5.62	Service & Instrument Air - Ins - RCA	-	64	7	7	9	53	-	32	172	172	-	-	122	225	-	-	-	19,881	1,186	-
4a.1.5.63	Service & Instrument Air - RCA	-	44	5	5	8	36	-	22	120	120	-	-	112	154	-	-	-	14,753	816	-
4a.1.5.64	Steam Gen Blowdown Cooling	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	372	-
4a.1.5.65	Steam Gen Blowdown Cooling - Ins - RCA	-	42	6	10	43	51	-	32	182	182	-	-	608	216	-	-	-	38,970	824	-
4a.1.5.66	Steam Gen Blowdown Cooling - Insulated	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	35	-
4a.1.5.67	Steam Gen Blowdown Cooling - RCA	-	56	8	13	58	71	-	43	248	248	-	-	825	300	-	-	-	53,317	1,077	-
4a.1.5.68	Steam Generator Blowdown	-	31	3	4	15	22	-	16	91	91	-	-	212	94	-	-	-	14,851	651	-
4a.1.5.69	Steam Generator Blowdown - Insulated	-	60	5	6	11	44	-	29	155	155	-	-	157	186	-	-	-	18,713	1,172	-

**Table D-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Disposal of Plant Systems (continued)																						
4a.1.5.70	Turbine	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	29	-
4a.1.5.71	Turbine Cooling Water	-	56	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	-	1,308	-
4a.1.5.72	Turbine Cooling Water - Insulated	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	-	854	-
4a.1.5.73	Turbine Lube Oil & Diesel Oil	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	-	1,596	-
4a.1.5.74	Water Treatment	-	69	-	-	-	-	-	10	80	-	-	80	-	-	-	-	-	-	-	1,622	-
4a.1.5.75	Water Treatment - Insulated	-	40	-	-	-	-	-	6	46	-	-	46	-	-	-	-	-	-	-	957	-
4a.1.5	Totals	-	6,438	324	456	1,196	2,914	-	2,189	13,518	8,587	-	4,931	17,022	12,387	-	-	-	-	1,509,853	142,527	-
4a.1.6	Scaffolding in support of decommissioning	-	633	13	5	48	13	-	171	884	884	-	-	618	54	-	-	-	-	31,415	15,869	-
4a.1	Subtotal Period 4a Activity Costs	173	20,937	14,563	6,335	3,932	33,390	490	22,463	102,283	97,352	-	4,931	61,851	51,504	751	393	2,886	7,449,968	274,385	5,077	-
Period 4a Additional Costs																						
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,380	414	1,794	1,794	-	-	-	-	-	-	-	-	-	26,083	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,380	414	1,794	1,794	-	-	-	-	-	-	-	-	-	26,083	-
Period 4a Collateral Costs																						
4a.3.1	Process decommissioning water waste	5	-	7	33	-	31	-	16	93	93	-	-	-	76	-	-	-	-	4,546	15	-
4a.3.3	Small tool allowance	-	216	-	-	-	-	-	32	248	224	-	25	-	-	-	-	-	-	-	-	-
4a.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	115	12	127	127	-	-	-	-	-	-	-	-	-	-	-
4a.3.5	Fixed Overhead	-	-	-	-	-	-	1,011	152	1,163	1,163	-	-	-	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	5	216	7	33	-	31	1,126	212	1,631	1,606	-	25	-	76	-	-	-	-	4,546	15	-
Period 4a Period-Dependent Costs																						
4a.4.1	Decon supplies	66	-	-	-	-	-	-	16	82	82	-	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	529	53	582	582	-	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	45	4	49	44	-	5	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,774	-	-	-	-	-	443	2,217	2,217	-	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,978	-	-	-	-	-	447	3,425	3,425	-	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	68	21	-	246	-	71	406	406	-	-	-	3,455	-	-	-	-	69,108	113	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	3,580	537	4,117	4,117	-	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	755	75	830	830	-	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	506	76	582	582	-	-	-	-	-	-	-	-	-	-	-
4a.4.10	NEI Fees	-	-	-	-	-	-	455	45	500	500	-	-	-	-	-	-	-	-	-	-	-
4a.4.11	Security Staff Cost	-	-	-	-	-	-	2,027	304	2,331	2,331	-	-	-	-	-	-	-	-	-	-	54,960
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	15,515	2,327	17,842	17,842	-	-	-	-	-	-	-	-	-	-	182,755
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	26,128	3,919	30,047	30,047	-	-	-	-	-	-	-	-	-	-	341,249
4a.4	Subtotal Period 4a Period-Dependent Costs	66	4,752	68	21	-	246	49,540	8,320	63,012	63,007	-	5	-	3,455	-	-	-	-	69,108	113	578,964
4a.0	TOTAL PERIOD 4a COST	243	25,905	14,638	6,389	3,932	33,668	52,536	31,409	168,719	163,759	-	4,961	61,851	55,035	751	393	2,886	7,523,623	300,595	584,042	-
<b>PERIOD 4b - Site Decontamination</b>																						
Period 4b Direct Decommissioning Activities																						
4b.1.1	Remove spent fuel racks	451	50	183	132	-	1,062	-	542	2,420	2,420	-	-	-	4,513	-	-	-	-	298,275	1,243	-
Disposal of Plant Systems																						
4b.1.2.1	Contnmt Spray & Refueling Water	-	405	132	194	316	1,360	-	531	2,938	2,938	-	-	4,499	5,850	-	-	-	-	564,781	8,741	-
4b.1.2.2	Contnmt Spray & Refueling Water - Ins	-	166	39	58	54	435	-	171	923	923	-	-	764	1,847	-	-	-	-	153,185	3,479	-
4b.1.2.3	Electrical - Contaminated	-	238	12	23	72	136	-	109	589	589	-	-	1,031	576	-	-	-	-	79,958	4,643	-
4b.1.2.4	Electrical - Decontaminated	-	1,644	113	202	646	1,215	-	853	4,674	4,674	-	-	9,189	5,165	-	-	-	-	714,614	30,800	-
4b.1.2.5	Emergency Diesel Generator	-	68	-	-	-	-	-	10	78	-	-	-	-	-	-	-	-	-	-	1,662	-
4b.1.2.6	Emergency Diesel Generator - Insulated	-	6	-	-	-	-	-	1	6	-	-	78	-	-	-	-	-	-	-	150	-
4b.1.2.7	Fire Protection - Insulated - RCA	-	2	0	0	1	1	-	1	6	6	-	6	-	17	-	-	-	-	1,130	38	-
4b.1.2.8	Fire Protection - RCA	-	23	2	4	16	18	-	13	76	78	-	-	228	78	-	-	-	-	14,402	455	-
4b.1.2.9	Fuel Pool	-	80	15	21	17	160	-	67	360	360	-	-	242	679	-	-	-	-	54,714	1,609	-
4b.1.2.10	Fuel Pool - Insulated	-	43	6	7	2	54	-	26	137	137	-	-	25	227	-	-	-	-	16,084	832	-
4b.1.2.11	HVAC - Contaminated	-	1,564	60	162	1,549	332	-	737	4,403	4,403	-	-	22,042	1,411	-	-	-	-	988,438	28,560	-
4b.1.2.12	Primary Water	-	146	24	39	83	257	-	121	670	670	-	-	1,185	1,122	-	-	-	-	120,385	3,100	-
4b.1.2.13	Primary Water - Insulated	-	3	0	0	0	2	-	1	7	7	-	-	1	11	-	-	-	-	739	51	-
4b.1.2.14	Radiation Monitoring	-	19	1	1	1	10	-	8	40	40	-	-	13	40	-	-	-	-	3,206	413	-
4b.1.2.15	Reactor Coolant - Insulated	-	70	8	9	7	66	-	37	196	196	-	-	100	279	-	-	-	-	22,609	1,487	-
4b.1.2.16	Refueling Equipment	-	108	10	18	48	116	-	67	367	367	-	-	689	493	-	-	-	-	60,584	2,357	-
4b.1.2.17	Secondary Side Wet Layup - Ins - RCA	-	12	1	2	2	12	-	7	36	36	-	-	29	50	-	-	-	-	4,504	209	-
4b.1.2.18	Secondary Side Wet Layup - RCA	-	12	1	2	9	9	-	7	41	41	-	-	130	39	-	-	-	-	7,843	224	-

Table D-1  
St. Lucie Nuclear Plant, Unit 1  
SAFSTOR Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4b.1.2.19	Waste Management	-	579	86	128	257	863	-	427	2,339	2,339	-	-	3,653	3,757	-	-	-	390,844	11,808	-
4b.1.2.20	Waste Management - Insulated	-	773	104	110	9	878	-	441	2,315	2,315	-	-	127	3,717	-	-	-	251,842	14,257	-
4b.1.2	Totals	-	5,959	614	979	3,089	5,925	-	3,635	20,201	20,116	-	85	43,965	25,350	-	-	-	3,449,862	114,874	-
4b.1.3	Scaffolding in support of decommissioning	-	950	20	8	72	19	-	256	1,325	1,325	-	-	927	82	-	-	-	47,122	23,804	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	976	1,254	64	848	221	1,721	-	1,399	6,483	6,483	-	-	3,150	21,278	-	-	-	1,819,354	42,347	-
4b.1.4.2	Primary Water Tank Foundation - Contam	0	4	1	13	-	18	-	7	42	42	-	-	-	291	-	-	-	25,176	68	-
4b.1.4.3	Reactor Auxiliary	453	149	6	67	70	95	-	308	1,148	1,148	-	-	995	1,464	-	-	-	165,661	12,274	-
4b.1.4.4	Refueling Water Storage Tank - Contam	0	6	2	27	-	38	-	15	88	88	-	-	-	620	-	-	-	53,730	108	-
4b.1.4.5	Fuel Handling	368	380	5	18	117	26	-	306	1,221	1,221	-	-	1,664	254	-	-	-	88,030	15,213	-
4b.1.4	Totals	1,797	1,794	77	973	408	1,897	-	2,036	8,982	8,982	-	-	5,809	23,906	-	-	-	2,151,951	70,010	-
4b.1	Subtotal Period 4b Activity Costs	2,249	8,753	893	2,092	3,569	8,903	-	6,469	32,928	32,844	-	85	50,701	53,851	-	-	-	5,947,210	209,930	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,088	326	1,414	1,414	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,422	727	3,149	3,149	-	-	-	-	-	-	-	-	45,787	-
4b.2.3	Contaminated Soil Remediation	-	1,512	787	5,971	-	15,657	-	5,267	29,194	29,194	-	-	-	1,021,167	-	-	-	102,116,700	17,019	-
4b.2.4	Soil - Clean Closure	-	-	-	-	-	-	1,605	241	1,845	1,845	-	-	-	-	-	-	-	-	-	-
4b.2.5	Storm Drain Remediation	-	290	121	353	-	848	-	350	1,961	1,961	-	-	-	54,930	-	-	-	5,530,085	5,808	-
4b.2.6	Decommissioning of ISFSI	-	339	3	649	-	1,015	1,749	939	4,693	4,693	-	-	-	14,954	-	-	-	2,185,620	12,534	4,650
4b.2	Subtotal Period 4b Additional Costs	-	2,142	910	6,973	-	17,520	6,863	7,849	42,257	42,257	-	-	-	1,091,051	-	-	-	109,832,400	81,148	10,890
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	11	-	17	78	-	73	-	37	216	216	-	-	-	177	-	-	-	10,600	34	-
4b.3.3	Small tool allowance	-	177	-	-	-	-	-	27	203	203	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	129	60	467	124	-	123	903	903	-	-	6,000	529	-	-	-	304,968	88	-
4b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	2,264	226	2,490	2,490	-	-	-	-	-	-	-	-	-	-
4b.3.6	Fixed Overhead	-	-	-	-	-	-	1,775	266	2,041	2,041	-	-	-	-	-	-	-	-	-	-
4b.3	Subtotal Period 4b Collateral Costs	11	177	146	137	467	198	4,038	679	5,853	5,853	-	-	6,000	706	-	-	-	315,568	123	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	822	-	-	-	-	-	-	205	1,027	1,027	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	929	93	1,022	1,022	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	78	8	86	86	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,967	-	-	-	-	-	492	2,459	2,459	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	5,368	-	-	-	-	-	805	6,174	6,174	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	76	23	-	276	-	80	455	455	-	-	-	3,876	-	-	-	77,517	126	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	4,962	744	5,706	5,706	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,325	133	1,458	1,458	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	889	133	1,022	1,022	-	-	-	-	-	-	-	-	-	-
4b.4.10	NEI Fees	-	-	-	-	-	-	798	80	878	878	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	3,558	534	4,092	4,092	-	-	-	-	-	-	-	-	-	96,480
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	17,510	2,626	20,136	20,136	-	-	-	-	-	-	-	-	-	215,931
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	27,931	4,190	32,121	32,121	-	-	-	-	-	-	-	-	-	385,920
4b.4	Subtotal Period 4b Period-Dependent Costs	822	7,335	76	23	-	276	57,980	10,123	76,635	76,635	-	-	-	3,876	-	-	-	77,517	126	698,331
4b.0	TOTAL PERIOD 4b COST	3,081	18,406	2,026	9,225	4,036	26,897	68,882	25,120	157,674	157,589	-	85	56,701	1,149,483	-	-	-	116,172,700	291,328	709,221
<b>PERIOD 4e - Delay before License Termination</b>																					
Period 4e Direct Decommissioning Activities																					
Period 4e Collateral Costs																					
4e.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-
4e.3.2	Fixed Overhead	-	-	-	-	-	-	1,099	165	1,264	1,264	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,100	165	1,265	1,265	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.2	Property taxes	-	-	-	-	-	-	48	5	53	53	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	81	-	-	-	-	-	20	101	101	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	2	1	-	7	-	2	11	11	-	-	-	96	-	-	-	1,923	3	-

**Table D-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes			Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet				
Period 4e Period-Dependent Costs (continued)																					
4e.4.6	NRC Fees	-	-	-	-	-	-	362	36	398	398	-	-	-	-	-	-	-	-	-	
4e.4.7	NEI Fees	-	-	-	-	-	-	494	49	544	544	-	-	-	-	-	-	-	-	-	
4e.4.8	Utility Staff Cost	-	-	-	-	-	-	1,438	216	1,654	1,654	-	-	-	-	-	-	-	-	19,920	
4e.4	Subtotal Period 4e Period-Dependent Costs	-	81	2	1	-	7	2,343	329	2,762	2,762	-	-	-	96	-	-	-	1,923	3	19,920
4e.0	TOTAL PERIOD 4e COST	-	81	2	1	-	7	3,443	493	4,027	4,027	-	-	-	96	-	-	-	1,923	3	19,920
<b>PERIOD 4f - License Termination</b>																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	165	49	214	214	-	-	-	-	-	-	-	-	-	
4f.1.2	Terminate license	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	165	49	214	214	-	-	-	-	-	-	-	-	-	
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	4,947	1,484	6,431	6,431	-	-	-	-	-	-	-	-	92,176	3,120
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	4,947	1,484	6,431	6,431	-	-	-	-	-	-	-	-	92,176	3,120
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-
4f.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	
4f.3.3	Fixed Overhead	-	-	-	-	-	-	607	91	698	698	-	-	-	-	-	-	-	-	-	
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,796	269	2,066	2,066	-	-	-	-	-	-	-	-	-	
Period 4f Period-Dependent Costs																					
4f.4.2	Property taxes	-	-	-	-	-	-	27	3	29	29	-	-	-	-	-	-	-	-	-	
4f.4.3	Health physics supplies	-	446	-	-	-	-	-	112	558	558	-	-	-	-	-	-	-	-	-	
4f.4.4	Disposal of DAW generated	-	-	5	1	-	18	-	5	29	29	-	-	247	-	-	-	-	4,938	8	
4f.4.5	Plant energy budget	-	-	-	-	-	-	453	68	520	520	-	-	-	-	-	-	-	-	-	
4f.4.6	NRC Fees	-	-	-	-	-	-	454	45	499	499	-	-	-	-	-	-	-	-	-	
4f.4.7	NEI Fees	-	-	-	-	-	-	273	27	300	300	-	-	-	-	-	-	-	-	-	
4f.4.8	Security Staff Cost	-	-	-	-	-	-	495	74	569	569	-	-	-	-	-	-	-	-	11,786	
4f.4.9	DOC Staff Cost	-	-	-	-	-	-	3,882	582	4,464	4,464	-	-	-	-	-	-	-	-	46,750	
4f.4.10	Utility Staff Cost	-	-	-	-	-	-	4,693	704	5,397	5,397	-	-	-	-	-	-	-	-	56,964	
4f.4	Subtotal Period 4f Period-Dependent Costs	-	446	5	1	-	18	10,276	1,620	12,367	12,367	-	-	-	247	-	-	-	4,938	8	115,500
4f.0	TOTAL PERIOD 4f COST	-	446	5	1	-	18	17,184	3,423	21,077	21,077	-	-	-	247	-	-	-	4,938	92,184	118,620
<b>PERIOD 4 TOTALS</b>		<b>3,324</b>	<b>44,839</b>	<b>16,671</b>	<b>15,615</b>	<b>7,968</b>	<b>60,589</b>	<b>142,045</b>	<b>60,445</b>	<b>351,497</b>	<b>346,452</b>	<b>-</b>	<b>5,046</b>	<b>118,552</b>	<b>1,204,861</b>	<b>751</b>	<b>393</b>	<b>2,886</b>	<b>123,703,200</b>	<b>684,110</b>	<b>1,431,803</b>
<b>PERIOD 5b - Site Restoration</b>																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	7,917	-	-	-	-	-	1,188	9,104	-	-	9,104	-	-	-	-	-	-	114,045	-
5b.1.1.2	Intake & CWS	-	468	-	-	-	-	-	70	538	-	-	538	-	-	-	-	-	-	6,556	-
5b.1.1.3	Miscellaneous Structures	-	1,274	-	-	-	-	-	191	1,465	-	-	1,465	-	-	-	-	-	-	17,962	-
5b.1.1.4	Primary Water Tank Foundation - Contam	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	48	-
5b.1.1.5	Reactor Auxiliary	-	1,788	-	-	-	-	-	268	2,056	-	-	2,056	-	-	-	-	-	-	22,733	-
5b.1.1.6	Refueling Water Storage Tank - Contam	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	106	-
5b.1.1.7	Security Improvements	-	245	-	-	-	-	-	37	282	-	-	282	-	-	-	-	-	-	2,317	-
5b.1.1.8	Turbine	-	1,112	-	-	-	-	-	167	1,278	-	-	1,278	-	-	-	-	-	-	17,837	-
5b.1.1.9	Turbine Pedestal	-	821	-	-	-	-	-	123	945	-	-	945	-	-	-	-	-	-	8,825	-
5b.1.1.10	Fuel Handling	-	1,054	-	-	-	-	-	158	1,212	-	-	1,212	-	-	-	-	-	-	14,207	-
5b.1.1	Totals	-	14,688	-	-	-	-	-	2,203	16,891	-	-	16,891	-	-	-	-	-	-	204,636	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	489	-	-	-	-	-	73	563	-	-	563	-	-	-	-	-	-	1,141	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	186	28	214	214	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	15,177	-	-	-	-	186	2,304	17,668	214	-	17,453	-	-	-	-	-	-	205,777	1,560

**Table D-1**  
**St. Lucie Nuclear Plant, Unit 1**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/ Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 5b Additional Costs																						
5b.2.1	Concrete Crushing	-	422	-	-	-	-	4	64	490	-	-	490	-	-	-	-	-	-	-	2,212	-
5b.2.2	Intake and Discharge Cofferdams	-	675	-	-	-	-	-	101	776	-	-	776	-	-	-	-	-	-	-	6,265	-
5b.2.3	Demolition of ISFSI	-	745	-	-	-	-	28	116	890	-	-	890	-	-	-	-	-	-	-	4,137	80
5b.2	Subtotal Period 5b Additional Costs	-	1,842	-	-	-	-	33	281	2,156	-	-	2,156	-	-	-	-	-	-	-	12,614	80
Period 5b Collateral Costs																						
5b.3.1	Small tool allowance	-	162	-	-	-	-	-	24	187	-	-	187	-	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	162	-	-	-	-	-	24	187	-	-	187	-	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																						
5b.4.2	Property taxes	-	-	-	-	-	-	66	7	73	-	-	73	-	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,265	-	-	-	-	-	940	7,204	-	-	7,204	-	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	561	84	645	-	-	645	-	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	1,121	168	1,289	-	-	1,289	-	-	-	-	-	-	-	-	25,838
5b.4.6	DOC Staff Cost	-	-	-	-	-	-	9,297	1,395	10,692	-	-	10,692	-	-	-	-	-	-	-	-	103,274
5b.4.7	Utility Staff Cost	-	-	-	-	-	-	4,252	638	4,889	-	-	4,889	-	-	-	-	-	-	-	-	50,663
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,265	-	-	-	-	15,297	3,231	24,792	-	-	24,792	-	-	-	-	-	-	-	-	179,775
5b.0	TOTAL PERIOD 5b COST	-	23,446	-	-	-	-	15,516	5,841	44,803	214	-	44,588	-	-	-	-	-	-	-	218,391	181,415
<b>PERIOD 5 TOTALS</b>		-	23,446	-	-	-	-	15,516	5,841	44,803	214	-	44,588	-	-	-	-	-	-	-	218,391	181,415
<b>TOTAL COST TO DECOMMISSION</b>		<b>8,097</b>	<b>80,118</b>	<b>17,671</b>	<b>17,035</b>	<b>13,131</b>	<b>63,212</b>	<b>715,940</b>	<b>154,214</b>	<b>1,069,419</b>	<b>740,055</b>	<b>278,217</b>	<b>51,148</b>	<b>145,569</b>	<b>1,226,775</b>	<b>751</b>	<b>393</b>	<b>2,886</b>	<b>125,532,100</b>	<b>1,033,780</b>	<b>6,368,173</b>	

<b>TOTAL COST TO DECOMMISSION WITH 16.85% CONTINGENCY:</b>	<b>\$1,069,419</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL NRC LICENSE TERMINATION COST IS 69.2% OR:</b>	<b>\$740,055</b>	<b>thousands of 2015 dollars</b>
<b>SPENT FUEL MANAGEMENT COST IS 26.02% OR:</b>	<b>\$278,217</b>	<b>thousands of 2015 dollars</b>
<b>NON-NUCLEAR DEMOLITION COST IS 4.78% OR:</b>	<b>\$51,148</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):</b>	<b>1,227,919</b>	<b>cubic feet</b>
<b>TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:</b>	<b>2,886</b>	<b>cubic feet</b>
<b>TOTAL SCRAP METAL REMOVED:</b>	<b>40,896</b>	<b>tons</b>
<b>TOTAL CRAFT LABOR REQUIREMENTS:</b>	<b>1,033,780</b>	<b>man-hours</b>

End Notes:  
n/a - indicates that this activity not charged as decommissioning expense.  
a - indicates that this activity performed by decommissioning staff.  
0 - indicates that this value is less than 0.5 but is non-zero.  
a cell containing " - " indicates a zero value

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 1a - Shutdown through Transition</b>																						
Period 1a Direct Decommissioning Activities																						
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	408	122	530	530	-	-	-	-	-	-	-	-	-	-	
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	67	10	76	76	-	-	-	-	-	-	-	-	-	556	
1a.1.3	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.4	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.5	Notification of Permanent Defueling	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.6	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	102	15	118	118	-	-	-	-	-	-	-	-	-	856	
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	67	10	76	76	-	-	-	-	-	-	-	-	-	556	
1a.1.9	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428	
1a.1.11	End product description	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428	
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	77	12	88	88	-	-	-	-	-	-	-	-	-	642	
1a.1.13	Define major work sequence	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428	
1a.1.14	Perform SER and EA	-	-	-	-	-	-	159	24	182	182	-	-	-	-	-	-	-	-	-	1,327	
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	256	38	294	294	-	-	-	-	-	-	-	-	-	2,140	
Activity Specifications																						
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	252	38	289	289	-	-	-	-	-	-	-	-	-	2,106	
1a.1.16.2	Plant systems	-	-	-	-	-	-	213	32	245	245	-	-	-	-	-	-	-	-	-	1,783	
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	1,335	
1a.1.16.4	Waste management	-	-	-	-	-	-	102	15	118	118	-	-	-	-	-	-	-	-	-	856	
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	102	15	118	118	-	-	-	-	-	-	-	-	-	856	
1a.1.16	Total	-	-	-	-	-	-	829	124	953	953	-	-	-	-	-	-	-	-	-	6,936	
Detailed Work Procedures																						
1a.1.17.1	Plant systems	-	-	-	-	-	-	61	9	70	70	-	-	-	-	-	-	-	-	-	506	
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	61	9	71	71	-	-	-	-	-	-	-	-	-	514	
1a.1.17	Total	-	-	-	-	-	-	122	18	140	140	-	-	-	-	-	-	-	-	-	1,020	
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	43	
1a.1.19	Drain/de-energize non-cont. systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.20	Drain & dry NSSS	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.21	Drain/de-energize contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1.22	Decon/secure contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	2,244	398	2,642	2,642	-	-	-	-	-	-	-	-	-	15,361	
Period 1a Collateral Costs																						
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,447	1,117	8,564	-	8,564	-	-	-	-	-	-	-	-	-	
1a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	
1a.3.3	Fixed Overhead	-	-	-	-	-	-	806	121	927	927	-	-	-	-	-	-	-	-	-	-	
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	8,253	1,238	9,491	928	8,564	-	-	-	-	-	-	-	-	-	
Period 1a Period-Dependent Costs																						
1a.4.1	Insurance	-	-	-	-	-	-	1,722	172	1,895	1,895	-	-	-	-	-	-	-	-	-	-	
1a.4.2	Property taxes	-	-	-	-	-	-	643	64	707	707	-	-	-	-	-	-	-	-	-	-	
1a.4.3	Health physics supplies	-	369	-	-	-	-	-	92	462	462	-	-	-	-	-	-	-	-	-	-	
1a.4.4	Heavy equipment rental	-	658	-	-	-	-	-	99	757	757	-	-	-	-	-	-	-	-	-	-	
1a.4.5	Disposal of DAW generated	-	-	10	3	-	35	-	10	58	58	-	-	-	493	-	-	-	-	9,854	16	
1a.4.6	Plant energy budget	-	-	-	-	-	-	3,003	451	3,454	3,454	-	-	-	-	-	-	-	-	-	-	
1a.4.7	NRC Fees	-	-	-	-	-	-	823	82	905	905	-	-	-	-	-	-	-	-	-	-	
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	667	67	734	-	734	-	-	-	-	-	-	-	-	-	
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	797	120	917	-	917	-	-	-	-	-	-	-	-	-	
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	-	
1a.4.11	INPO Fees	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	-	
1a.4.12	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-	
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,191	1,079	8,269	8,269	-	-	-	-	-	-	-	-	-	147,043	
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	31,064	4,660	35,724	35,724	-	-	-	-	-	-	-	-	-	423,400	
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,028	10	3	-	35	47,162	7,023	55,261	53,554	1,707	-	-	493	-	-	-	-	9,854	16	570,443
1a.0	TOTAL PERIOD 1a COST	-	1,028	10	3	-	35	57,660	8,659	67,394	57,123	10,271	-	-	493	-	-	-	-	9,854	16	585,804

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 1b - SAFSTOR Limited DECON Activities</b>																						
Period 1b Direct Decommissioning Activities																						
Decontamination of Site Buildings																						
1b.1.1.1	Reactor	1,061	-	-	-	-	-	-	530	1,591	1,591	-	-	-	-	-	-	-	-	-	22,339	-
1b.1.1.2	Reactor Auxiliary	485	-	-	-	-	-	-	243	728	728	-	-	-	-	-	-	-	-	-	10,511	-
1b.1.1.3	Steam Generator Blowdown Treatment	142	-	-	-	-	-	-	71	213	213	-	-	-	-	-	-	-	-	-	3,024	-
1b.1.1.4	Fuel Handling	366	-	-	-	-	-	-	183	549	549	-	-	-	-	-	-	-	-	-	7,120	-
1b.1.1	Totals	2,054	-	-	-	-	-	-	1,027	3,081	3,081	-	-	-	-	-	-	-	-	-	42,994	-
1b.1	Subtotal Period 1b Activity Costs	2,054	-	-	-	-	-	-	1,027	3,081	3,081	-	-	-	-	-	-	-	-	-	42,994	-
Period 1b Collateral Costs																						
1b.3.1	Decon equipment	860	-	-	-	-	-	-	129	989	989	-	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	162	-	99	450	-	424	-	264	1,399	1,399	-	-	-	1,023	-	-	-	-	-	61,355	199
1b.3.4	Small tool allowance	-	31	-	-	-	-	-	5	35	35	-	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,219	183	1,402	-	1,402	-	-	-	-	-	-	-	-	-	-
1b.3.6	Florida LLRW Inspection Fee	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-	-
1b.3.7	Fixed Overhead	-	-	-	-	-	-	203	30	234	234	-	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,022	31	99	450	-	424	1,425	612	4,062	2,660	1,402	-	-	1,023	-	-	-	-	-	61,355	199
Period 1b Period-Dependent Costs																						
1b.4.1	Decon supplies	793	-	-	-	-	-	-	198	992	992	-	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	430	43	473	473	-	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	9	1	10	10	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	282	-	-	-	-	-	70	352	352	-	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	166	-	-	-	-	-	25	191	191	-	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	11	3	-	41	-	12	67	67	-	-	572	-	-	-	-	-	-	11,431	19
1b.4.7	Plant energy budget	-	-	-	-	-	-	757	114	871	871	-	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	118	12	130	130	-	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	168	17	185	-	185	-	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	201	30	231	-	231	-	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-	-
1b.4.12	NEI Fees	-	-	-	-	-	-	91	9	100	100	-	-	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,812	272	2,084	2,084	-	-	-	-	-	-	-	-	-	-	37,063
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	7,830	1,174	9,004	9,004	-	-	-	-	-	-	-	-	-	-	106,720
1b.4	Subtotal Period 1b Period-Dependent Costs	793	448	11	3	-	41	11,429	1,979	14,705	14,274	430	-	-	572	-	-	-	-	-	11,431	19
1b.0	TOTAL PERIOD 1b COST	3,869	479	110	453	-	465	12,855	3,618	21,848	20,015	1,832	-	-	1,594	-	-	-	-	-	72,786	43,212
<b>PERIOD 1c - Preparations for SAFSTOR Dormancy</b>																						
Period 1c Direct Decommissioning Activities																						
1c.1.1	Prepare support equipment for storage	-	435	-	-	-	-	-	65	501	501	-	-	-	-	-	-	-	-	-	-	3,000
1c.1.2	Install containment pressure equal. lines	-	36	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	-	-	700
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	-	-	13,040
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	30	4	34	34	-	-	-	-	-	-	-	-	-	-	250
1c.1	Subtotal Period 1c Activity Costs	-	471	-	-	-	-	763	295	1,529	1,529	-	-	-	-	-	-	-	-	-	-	16,740
Period 1c Additional Costs																						
1c.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,391	1,109	8,500	8,500	-	-	-	-	-	-	-	-	-	-	-
1c.2	Subtotal Period 1c Additional Costs	-	-	-	-	-	-	7,391	1,109	8,500	8,500	-	-	-	-	-	-	-	-	-	-	-
Period 1c Collateral Costs																						
1c.3.1	Process decommissioning water waste	194	-	119	541	-	510	-	318	1,683	1,683	-	-	-	1,230	-	-	-	-	-	73,824	240
1c.3.3	Small tool allowance	-	3	-	-	-	-	-	0	4	4	-	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,233	185	1,417	-	1,417	-	-	-	-	-	-	-	-	-	-
1c.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	3	0	3	3	-	-	-	-	-	-	-	-	-	-	-
1c.3.6	Fixed Overhead	-	-	-	-	-	-	205	31	236	236	-	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	194	3	119	541	-	510	1,440	534	3,343	1,925	1,417	-	-	1,230	-	-	-	-	-	73,824	240

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 1c Period-Dependent Costs																						
1c.4.1	Insurance	-	-	-	-	-	-	435	43	478	478	-	-	-	-	-	-	-	-	-	-	
1c.4.2	Property taxes	-	-	-	-	-	-	9	1	10	10	-	-	-	-	-	-	-	-	-	-	
1c.4.3	Health physics supplies	-	168	-	-	-	-	-	42	210	210	-	-	-	-	-	-	-	-	-	-	
1c.4.4	Heavy equipment rental	-	168	-	-	-	-	-	25	193	193	-	-	-	-	-	-	-	-	-	-	
1c.4.5	Disposal of DAW generated	-	-	2	1	-	9	-	3	15	15	-	-	-	126	-	-	-	-	2,511	4	
1c.4.6	Plant energy budget	-	-	-	-	-	-	765	115	880	880	-	-	-	-	-	-	-	-	-	-	
1c.4.7	NRC Fees	-	-	-	-	-	-	120	12	132	132	-	-	-	-	-	-	-	-	-	-	
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	170	17	187	-	187	-	-	-	-	-	-	-	-	-	
1c.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	203	30	234	-	234	-	-	-	-	-	-	-	-	-	
1c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-	
1c.4.11	NEI Fees	-	-	-	-	-	-	92	9	102	102	-	-	-	-	-	-	-	-	-	-	
1c.4.12	Security Staff Cost	-	-	-	-	-	-	1,832	275	2,107	2,107	-	-	-	-	-	-	-	-	-	37,466	
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	7,915	1,187	9,102	9,102	-	-	-	-	-	-	-	-	-	107,880	
1c.4	Subtotal Period 1c Period-Dependent Costs	-	336	2	1	-	9	11,554	1,762	13,663	13,228	435	-	-	126	-	-	-	-	2,511	4	145,346
1c.0	TOTAL PERIOD 1c COST	194	811	122	542	-	519	21,148	3,700	27,035	25,183	1,852	-	-	1,356	-	-	-	-	76,334	16,984	145,595
<b>PERIOD 1 TOTALS</b>		<b>4,063</b>	<b>2,317</b>	<b>242</b>	<b>998</b>	<b>-</b>	<b>1,019</b>	<b>91,662</b>	<b>15,976</b>	<b>116,277</b>	<b>102,321</b>	<b>13,955</b>	<b>-</b>	<b>-</b>	<b>3,443</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>158,975</b>	<b>60,212</b>	<b>875,182</b>
<b>PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage</b>																						
Period 2a Direct Decommissioning Activities																						
2a.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2a.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2a.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	221	33	254	254	-	-	-	-	-	-	-	-	-	-	
2a.1.5	Maintenance supplies	-	-	-	-	-	-	559	140	699	699	-	-	-	-	-	-	-	-	-	-	
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	780	173	953	953	-	-	-	-	-	-	-	-	-	-	
Period 2a Collateral Costs																						
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	42,973	6,446	49,419	-	49,419	-	-	-	-	-	-	-	-	-	
2a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	
2a.3.3	Fixed Overhead	-	-	-	-	-	-	3,219	483	3,702	3,702	-	-	-	-	-	-	-	-	-	-	
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	46,193	6,929	53,122	3,703	49,419	-	-	-	-	-	-	-	-	-	
Period 2a Period-Dependent Costs																						
2a.4.1	Insurance	-	-	-	-	-	-	1,686	169	1,854	1,854	0	-	-	-	-	-	-	-	-	-	
2a.4.2	Property taxes	-	-	-	-	-	-	142	14	156	156	-	-	-	-	-	-	-	-	-	-	
2a.4.3	Health physics supplies	-	552	-	-	-	-	-	138	690	690	-	-	-	-	-	-	-	-	-	-	
2a.4.4	Disposal of DAW generated	-	-	13	4	-	49	-	14	81	81	-	-	686	-	-	-	-	-	13,715	22	
2a.4.5	Plant energy budget	-	-	-	-	-	-	2,399	360	2,759	1,380	1,380	-	-	-	-	-	-	-	-	-	
2a.4.6	NRC Fees	-	-	-	-	-	-	1,107	111	1,218	1,218	-	-	-	-	-	-	-	-	-	-	
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,831	183	2,014	-	2,014	-	-	-	-	-	-	-	-	-	
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	3,185	478	3,663	-	3,663	-	-	-	-	-	-	-	-	-	
2a.4.9	ISFSI Operating Costs	-	-	-	-	-	-	196	29	225	-	225	-	-	-	-	-	-	-	-	-	
2a.4.10	NEI Fees	-	-	-	-	-	-	1,447	145	1,592	-	1,592	-	-	-	-	-	-	-	-	-	
2a.4.11	Security Staff Cost	-	-	-	-	-	-	18,680	2,802	21,482	3,372	18,111	-	-	-	-	-	-	-	-	358,251	
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	25,729	3,859	29,589	4,170	25,419	-	-	-	-	-	-	-	-	329,091	
2a.4	Subtotal Period 2a Period-Dependent Costs	-	552	13	4	-	49	56,403	8,302	65,323	12,919	52,404	-	-	686	-	-	-	-	13,715	22	687,343
2a.0	TOTAL PERIOD 2a COST	-	552	13	4	-	49	103,376	15,404	119,398	17,575	101,822	-	-	686	-	-	-	-	13,715	22	687,343
<b>PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage</b>																						
Period 2b Direct Decommissioning Activities																						
2b.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2b.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2b.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	1,399	210	1,609	1,609	-	-	-	-	-	-	-	-	-	-	
2b.1.5	Maintenance supplies	-	-	-	-	-	-	3,534	883	4,417	4,417	-	-	-	-	-	-	-	-	-	-	
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	4,932	1,093	6,026	6,026	-	-	-	-	-	-	-	-	-	-	

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	28,295	4,244	32,539	-	32,539	-	-	-	-	-	-	-	-	-
2b.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	4	0	4	4	-	-	-	-	-	-	-	-	-	-
2b.3.3	Fixed Overhead	-	-	-	-	-	-	4,071	611	4,681	4,681	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	32,369	4,855	37,224	4,685	32,539	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	10,735	1,073	11,808	11,722	86	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	896	90	986	986	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	1,559	-	-	-	-	-	390	1,949	1,949	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	37	11	-	133	-	39	220	220	-	-	-	1,871	-	-	-	37,429	61	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	7,586	1,138	8,724	8,724	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	6,756	676	7,432	7,432	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	11,579	1,158	12,737	-	12,737	-	-	-	-	-	-	-	-	-
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	1,236	185	1,422	-	1,422	-	-	-	-	-	-	-	-	-
2b.4.9	Security Staff Cost	-	-	-	-	-	-	52,133	7,820	59,953	21,319	38,634	-	-	-	-	-	-	-	-	1,106,280
2b.4.10	Utility Staff Cost	-	-	-	-	-	-	39,273	5,891	45,164	26,367	18,797	-	-	-	-	-	-	-	-	526,800
2b.4	Subtotal Period 2b Period-Dependent Costs	-	1,559	37	11	-	133	130,194	18,459	150,394	78,718	71,676	-	-	1,871	-	-	-	37,429	61	1,633,080
2b.0	TOTAL PERIOD 2b COST	-	1,559	37	11	-	133	167,496	24,408	193,644	89,429	104,215	-	-	1,871	-	-	-	37,429	61	1,633,080
<b>PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage</b>																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2c.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2c.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	896	134	1,031	1,031	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	2,264	566	2,830	2,830	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	3,160	700	3,860	3,860	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																					
2c.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	2	0	2	2	-	-	-	-	-	-	-	-	-	-
2c.3.2	Fixed Overhead	-	-	-	-	-	-	2,608	391	2,999	2,999	-	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	2,610	391	3,001	3,001	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	6,827	683	7,509	7,509	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	574	57	632	632	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	953	-	-	-	-	-	238	1,191	1,191	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	22	7	-	80	-	23	132	132	-	-	-	1,125	-	-	-	22,505	37	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	4,860	729	5,589	5,589	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	4,180	418	4,598	4,598	-	-	-	-	-	-	-	-	-	-
2c.4.7	Security Staff Cost	-	-	-	-	-	-	11,876	1,781	13,658	13,658	-	-	-	-	-	-	-	-	-	253,114
2c.4.8	Utility Staff Cost	-	-	-	-	-	-	14,688	2,203	16,891	16,891	-	-	-	-	-	-	-	-	-	209,916
2c.4	Subtotal Period 2c Period-Dependent Costs	-	953	22	7	-	80	43,005	6,133	50,200	50,200	-	-	-	1,125	-	-	-	22,505	37	463,030
2c.0	TOTAL PERIOD 2c COST	-	953	22	7	-	80	48,775	7,225	57,062	57,062	-	-	-	1,125	-	-	-	22,505	37	463,030
<b>PERIOD 2 TOTALS</b>																					
<b>PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy</b>																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	67	10	76	76	-	-	-	-	-	-	-	-	-	556
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	235	35	271	271	-	-	-	-	-	-	-	-	-	1,969
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
3a.1.4	End product description	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	428
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	67	10	76	76	-	-	-	-	-	-	-	-	-	556
3a.1.6	Define major work sequence	-	-	-	-	-	-	384	58	441	441	-	-	-	-	-	-	-	-	-	3,210
3a.1.7	Perform SER and EA	-	-	-	-	-	-	159	24	182	182	-	-	-	-	-	-	-	-	-	1,327
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	256	38	294	294	-	-	-	-	-	-	-	-	-	2,140
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	210	31	241	241	-	-	-	-	-	-	-	-	-	1,753
3a.1.10	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Activity Specifications																						
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	377	57	434	390	-	43	-	-	-	-	-	-	-	-	3,154
3a.1.11.2	Plant systems	-	-	-	-	-	-	213	32	245	221	-	25	-	-	-	-	-	-	-	-	1,783
3a.1.11.3	Reactor internals	-	-	-	-	-	-	363	54	418	418	-	-	-	-	-	-	-	-	-	-	3,039
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	333	50	382	382	-	-	-	-	-	-	-	-	-	-	2,782
3a.1.11.5	Biological shield	-	-	-	-	-	-	26	4	29	29	-	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	-	1,335
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	82	12	94	47	-	47	-	-	-	-	-	-	-	-	685
3a.1.11.8	Main Turbine	-	-	-	-	-	-	20	3	24	-	-	24	-	-	-	-	-	-	-	-	171
3a.1.11.9	Main Condensers	-	-	-	-	-	-	20	3	24	-	-	24	-	-	-	-	-	-	-	-	171
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	160	24	184	92	-	92	-	-	-	-	-	-	-	-	1,335
3a.1.11.11	Waste management	-	-	-	-	-	-	235	35	271	271	-	-	-	-	-	-	-	-	-	-	1,969
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	46	7	53	26	-	26	-	-	-	-	-	-	-	-	385
3a.1.11	Total	-	-	-	-	-	-	2,035	305	2,340	2,060	-	280	-	-	-	-	-	-	-	-	17,024
Planning & Site Preparations																						
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	123	18	141	141	-	-	-	-	-	-	-	-	-	-	1,027
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	3,100	465	3,565	3,565	-	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	72	11	82	82	-	-	-	-	-	-	-	-	-	-	599
3a.1.15	Rigging/Cont. Cntrl Envlp/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-	526
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	9,119	1,368	10,487	10,207	-	280	-	-	-	-	-	-	-	-	31,117
Period 3a Additional Costs																						
3a.2.1	Site Characterization	-	-	-	-	-	-	2,455	736	3,191	3,191	-	-	-	-	-	-	-	-	-	13,042	4,640
3a.2	Subtotal Period 3a Additional Costs	-	-	-	-	-	-	2,455	736	3,191	3,191	-	-	-	-	-	-	-	-	-	13,042	4,640
Period 3a Collateral Costs																						
3a.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	-
3a.3.2	Fixed Overhead	-	-	-	-	-	-	806	121	927	927	-	-	-	-	-	-	-	-	-	-	-
3a.3	Subtotal Period 3a Collateral Costs	-	-	-	-	-	-	807	121	927	927	-	-	-	-	-	-	-	-	-	-	-
Period 3a Period-Dependent Costs																						
3a.4.1	Insurance	-	-	-	-	-	-	422	42	464	464	-	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	35	4	39	39	-	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	289	-	-	-	-	-	72	361	361	-	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	658	-	-	-	-	-	99	757	757	-	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	7	2	-	26	-	8	43	43	-	-	-	364	-	-	-	-	7,277	12	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	3,003	451	3,454	3,454	-	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	341	34	375	375	-	-	-	-	-	-	-	-	-	-	-
3a.4.8	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-	-
3a.4.9	Security Staff Cost	-	-	-	-	-	-	1,428	214	1,642	1,642	-	-	-	-	-	-	-	-	-	-	37,814
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	14,386	2,158	16,544	16,544	-	-	-	-	-	-	-	-	-	-	200,229
3a.4	Subtotal Period 3a Period-Dependent Costs	-	947	7	2	-	26	19,978	3,117	24,077	24,077	-	-	-	364	-	-	-	-	7,277	12	238,043
3a.0	TOTAL PERIOD 3a COST	-	947	7	2	-	26	32,358	5,342	38,683	38,403	-	280	-	364	-	-	-	-	7,277	13,054	273,799
<b>PERIOD 3b - Decommissioning Preparations</b>																						
Period 3b Direct Decommissioning Activities																						
Detailed Work Procedures																						
3b.1.1.1	Plant systems	-	-	-	-	-	-	242	36	278	251	-	28	-	-	-	-	-	-	-	-	2,026
3b.1.1.2	Reactor internals	-	-	-	-	-	-	128	19	147	147	-	-	-	-	-	-	-	-	-	-	1,070
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	69	10	79	20	-	60	-	-	-	-	-	-	-	-	578
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	-	428
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	-	428
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	-	428
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	186	28	214	214	-	-	-	-	-	-	-	-	-	-	1,554
3b.1.1.8	Facility closeout	-	-	-	-	-	-	61	9	71	35	-	35	-	-	-	-	-	-	-	-	514
3b.1.1.9	Missile shields	-	-	-	-	-	-	23	3	26	26	-	-	-	-	-	-	-	-	-	-	193
3b.1.1.10	Biological shield	-	-	-	-	-	-	61	9	71	71	-	-	-	-	-	-	-	-	-	-	514
3b.1.1.11	Steam generators	-	-	-	-	-	-	235	35	271	271	-	-	-	-	-	-	-	-	-	-	1,969
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	51	8	59	29	-	29	-	-	-	-	-	-	-	-	428
3b.1.1.13	Main Turbine	-	-	-	-	-	-	80	12	92	-	-	92	-	-	-	-	-	-	-	-	668

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Detailed Work Procedures (continued)																						
3b.1.1.14	Main Condensers	-	-	-	-	-	-	80	12	92	-	-	92	-	-	-	-	-	-	-	668	
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	140	21	161	145	-	16	-	-	-	-	-	-	-	1,168	
3b.1.1.16	Reactor building	-	-	-	-	-	-	140	21	161	145	-	16	-	-	-	-	-	-	-	1,168	
3b.1.1	Total	-	-	-	-	-	-	1,649	247	1,897	1,529	-	368	-	-	-	-	-	-	-	13,800	
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,649	247	1,897	1,529	-	368	-	-	-	-	-	-	-	13,800	
Period 3b Additional Costs																						
3b.2.1	Misc Hazardous Waste	-	-	665	169	5,164	-	-	866	6,863	6,863	-	-	27,017	-	-	-	-	-	1,397,259	5,520	-
3b.2	Subtotal Period 3b Additional Costs	-	-	665	169	5,164	-	-	866	6,863	6,863	-	-	27,017	-	-	-	-	-	1,397,259	5,520	-
Period 3b Collateral Costs																						
3b.3.1	Decon equipment	860	-	-	-	-	-	-	129	989	989	-	-	-	-	-	-	-	-	-	-	
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-	
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-	
3b.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	
3b.3.5	Fixed Overhead	-	-	-	-	-	-	408	61	470	470	-	-	-	-	-	-	-	-	-	-	
3b.3	Subtotal Period 3b Collateral Costs	860	1,200	-	-	-	-	1,597	549	4,206	4,206	-	-	-	-	-	-	-	-	-	-	
Period 3b Period-Dependent Costs																						
3b.4.1	Decon supplies	27	-	-	-	-	-	-	7	33	33	-	-	-	-	-	-	-	-	-	-	
3b.4.2	Insurance	-	-	-	-	-	-	214	21	235	235	-	-	-	-	-	-	-	-	-	-	
3b.4.3	Property taxes	-	-	-	-	-	-	18	2	20	20	-	-	-	-	-	-	-	-	-	-	
3b.4.4	Health physics supplies	-	186	-	-	-	-	-	47	233	233	-	-	-	-	-	-	-	-	-	-	
3b.4.5	Heavy equipment rental	-	334	-	-	-	-	-	50	384	384	-	-	-	-	-	-	-	-	-	-	
3b.4.6	Disposal of DAW generated	-	-	4	1	-	15	-	4	25	25	-	-	-	209	-	-	-	-	4,189	7	
3b.4.7	Plant energy budget	-	-	-	-	-	-	1,522	228	1,751	1,751	-	-	-	-	-	-	-	-	-	-	
3b.4.8	NRC Fees	-	-	-	-	-	-	173	17	190	190	-	-	-	-	-	-	-	-	-	-	
3b.4.9	NEI Fees	-	-	-	-	-	-	184	18	202	202	-	-	-	-	-	-	-	-	-	-	
3b.4.10	Security Staff Cost	-	-	-	-	-	-	724	109	832	832	-	-	-	-	-	-	-	-	-	19,166	
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	3,515	527	4,042	4,042	-	-	-	-	-	-	-	-	-	43,343	
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	7,291	1,094	8,385	8,385	-	-	-	-	-	-	-	-	-	101,486	
3b.4	Subtotal Period 3b Period-Dependent Costs	27	520	4	1	-	15	13,641	2,124	16,332	16,332	-	-	-	209	-	-	-	-	4,189	7	163,995
3b.0	TOTAL PERIOD 3b COST	887	1,720	669	170	5,164	15	16,887	3,787	29,298	28,930	-	368	27,017	209	-	-	-	-	1,401,448	5,527	177,795
<b>PERIOD 3 TOTALS</b>		<b>887</b>	<b>2,667</b>	<b>676</b>	<b>172</b>	<b>5,164</b>	<b>41</b>	<b>49,245</b>	<b>9,129</b>	<b>67,980</b>	<b>67,332</b>	<b>-</b>	<b>648</b>	<b>27,017</b>	<b>573</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,408,724</b>	<b>18,581</b>	<b>451,594</b>
<b>PERIOD 4a - Large Component Removal</b>																						
Period 4a Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
4a.1.1.1	Reactor Coolant Piping	12	45	9	17	9	181	-	67	341	341	-	-	47	445	-	-	-	-	56,074	1,227	-
4a.1.1.2	Pressurizer Relief Tank	1	5	2	3	2	28	-	10	50	50	-	-	8	71	-	-	-	-	8,699	142	-
4a.1.1.3	Reactor Coolant Pumps & Motors	34	77	60	147	-	2,140	-	599	3,058	3,058	-	-	-	6,541	-	-	-	-	564,000	3,039	80
4a.1.1.4	Pressurizer	8	51	357	104	-	1,098	-	343	1,961	1,961	-	-	-	3,358	-	-	-	-	238,456	1,508	750
4a.1.1.5	Steam Generators	39	3,338	1,600	3,867	1,633	4,706	-	3,015	18,198	18,198	-	-	30,926	14,387	-	-	-	-	2,498,110	10,254	2,250
4a.1.1.6	CRDMs/ICIs/Service Structure Removal	32	260	272	99	27	584	-	273	1,548	1,548	-	-	419	3,724	-	-	-	-	179,672	6,113	-
4a.1.1.7	Reactor Vessel Internals	47	2,525	10,141	946	-	4,821	242	7,135	25,856	25,856	-	-	-	1,460	751	393	-	-	259,737	21,417	989
4a.1.1.8	Vessel & Internals GTCC Disposal	-	-	-	-	-	13,009	-	1,951	14,960	14,960	-	-	-	-	-	-	2,886	-	567,289	-	-
4a.1.1.9	Reactor Vessel	-	4,601	1,499	594	-	3,024	242	5,523	15,483	15,483	-	-	-	9,245	-	-	-	-	945,965	21,417	989
4a.1.1	Totals	173	10,904	13,939	5,777	1,670	29,592	485	18,917	81,456	81,456	-	-	31,399	39,230	751	393	2,886	-	5,318,000	65,116	5,057
Removal of Major Equipment																						
4a.1.2	Main Turbine/Generator	-	305	113	35	449	-	-	160	1,061	1,061	-	-	5,764	-	-	-	-	-	259,396	6,450	-
4a.1.3	Main Condensers	-	935	128	40	509	-	-	329	1,941	1,941	-	-	6,545	-	-	-	-	-	294,503	20,075	-
Cascading Costs from Clean Building Demolition																						
4a.1.4.1	Reactor	-	1,378	-	-	-	-	-	207	1,585	1,585	-	-	-	-	-	-	-	-	-	19,868	-
4a.1.4.2	Reactor Auxiliary	-	198	-	-	-	-	-	30	228	228	-	-	-	-	-	-	-	-	-	2,515	-
4a.1.4.3	Steam Generator Blowdown Treatment	-	27	-	-	-	-	-	4	31	31	-	-	-	-	-	-	-	-	-	374	-
4a.1.4.4	Fuel Handling	-	114	-	-	-	-	-	17	131	131	-	-	-	-	-	-	-	-	-	1,519	-
4a.1.4	Totals	-	1,718	-	-	-	-	-	258	1,976	1,976	-	-	-	-	-	-	-	-	-	24,277	-

Table D-2  
St. Lucie Nuclear Plant, Unit 2  
SAFSTOR Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Disposal of Plant Systems																						
4a.1.5.1	Air Evacuation	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	-	177	-
4a.1.5.2	Air Evacuation - Insulated	-	32	-	-	-	-	-	5	37	-	-	37	-	-	-	-	-	-	-	777	-
4a.1.5.3	Auxiliary Steam - Insulated	-	17	-	-	-	-	-	3	19	-	-	19	-	-	-	-	-	-	-	410	-
4a.1.5.4	Chemical & Volume Control	-	104	15	22	44	147	-	74	406	406	-	-	633	638	-	-	-	-	66,846	2,128	-
4a.1.5.5	Chemical & Volume Control - Insulated	-	578	77	82	5	652	-	328	1,721	1,721	-	-	73	2,759	-	-	-	-	186,014	10,656	-
4a.1.5.6	Chemical Feed	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	71	-
4a.1.5.7	Chemical Feed - Insulated	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	42	-
4a.1.5.8	Circulating & Intake Cooling Water	-	273	-	-	-	-	-	41	314	-	-	314	-	-	-	-	-	-	-	6,590	-
4a.1.5.9	Component Cooling	-	91	-	-	-	-	-	14	105	-	-	105	-	-	-	-	-	-	-	2,187	-
4a.1.5.10	Component Cooling - RCA	-	347	58	104	476	540	-	315	1,841	1,841	-	-	6,782	2,293	-	-	-	-	427,071	6,932	-
4a.1.5.11	Condensate	-	199	-	-	-	-	-	30	229	-	-	229	-	-	-	-	-	-	-	4,668	-
4a.1.5.12	Condensate - Insulated	-	118	-	-	-	-	-	18	135	-	-	135	-	-	-	-	-	-	-	2,879	-
4a.1.5.13	Condensate Recovery	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	-	113	-
4a.1.5.14	Condensate Recovery - Insulated	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	15	-
4a.1.5.15	Condensate Recovery - Insulated - RCA	-	1	0	0	0	1	-	0	2	2	-	-	2	3	-	-	-	-	293	15	-
4a.1.5.16	Condensate Recovery - RCA	-	12	1	2	9	8	-	7	39	39	-	-	134	33	-	-	-	-	7,654	236	-
4a.1.5.17	Condenser Tube Cleaning	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	-	920	-
4a.1.5.18	Demineralized Makeup Water	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	-	137	-
4a.1.5.19	Demineralized Makeup Water - RCA	-	6	1	1	1	6	-	3	19	19	-	-	12	27	-	-	-	-	2,308	101	-
4a.1.5.20	Domestic/Makeup/Service Water	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	-	215	-
4a.1.5.21	Domestic/Makeup/Service Water - RCA	-	23	2	3	6	23	-	13	71	71	-	-	88	98	-	-	-	-	10,067	409	-
4a.1.5.22	Domestic/Makeup/Service Water-Ins	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	19	-
4a.1.5.23	Domestic/Makeup/Service Water-Ins - RCA	-	2	0	0	0	2	-	1	7	7	-	-	6	9	-	-	-	-	822	44	-
4a.1.5.24	Electrical - Clean	-	3,577	-	-	-	-	-	537	4,114	-	-	4,114	-	-	-	-	-	-	-	81,595	-
4a.1.5.25	Extraction Steam	-	83	-	-	-	-	-	12	96	-	-	96	-	-	-	-	-	-	-	1,887	-
4a.1.5.26	Extraction Steam - Insulated	-	93	-	-	-	-	-	14	107	-	-	107	-	-	-	-	-	-	-	2,280	-
4a.1.5.27	Feedwater - Insulated	-	126	-	-	-	-	-	19	145	-	-	145	-	-	-	-	-	-	-	3,077	-
4a.1.5.28	Feedwater - Insulated - RCA	-	42	6	10	46	50	-	32	186	186	-	-	662	213	-	-	-	-	40,945	828	-
4a.1.5.29	Fire Protection	-	54	-	-	-	-	-	8	63	-	-	63	-	-	-	-	-	-	-	1,310	-
4a.1.5.30	Fire Protection - Insulated	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	-	145	-
4a.1.5.31	HVAC	-	261	-	-	-	-	-	39	300	-	-	300	-	-	-	-	-	-	-	6,876	-
4a.1.5.32	Heater Drain & Vents - Insulated	-	222	-	-	-	-	-	33	255	-	-	255	-	-	-	-	-	-	-	5,363	-
4a.1.5.33	Hydrogen Sampling	-	46	5	7	27	38	-	26	149	149	-	-	378	162	-	-	-	-	26,104	933	-
4a.1.5.34	Integrated Leak Rate Testing	-	32	3	4	16	25	-	18	97	97	-	-	224	105	-	-	-	-	16,086	638	-
4a.1.5.35	Main Steam - Insulated	-	202	-	-	-	-	-	30	232	-	-	232	-	-	-	-	-	-	-	4,827	-
4a.1.5.36	Main Steam - Insulated - RCA	-	44	6	10	52	52	-	34	197	197	-	-	733	221	-	-	-	-	44,394	874	-
4a.1.5.37	Misc Bulk Gas Supply	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	346	-
4a.1.5.38	Misc Bulk Gas Supply - RCA	-	11	1	1	1	10	-	6	31	31	-	-	18	43	-	-	-	-	3,603	193	-
4a.1.5.39	Miscellaneous	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	33	-
4a.1.5.40	Miscellaneous - RCA	-	5	1	2	11	9	-	5	32	32	-	-	155	37	-	-	-	-	8,715	98	-
4a.1.5.41	Post Accident Sampling	-	3	0	0	-	1	-	1	5	5	-	-	-	3	-	-	-	-	205	70	-
4a.1.5.42	Post Accident Sampling - Insulated	-	27	1	1	-	7	-	9	44	44	-	-	-	28	-	-	-	-	1,842	632	-
4a.1.5.43	RCP Oil Collection	-	7	-	-	1	8	-	4	22	22	-	-	10	36	-	-	-	-	2,778	127	-
4a.1.5.44	SGBTF Blowdown - Insulated	-	671	39	80	555	293	-	340	1,977	1,977	-	-	7,896	1,252	-	-	-	-	402,818	13,773	-
4a.1.5.45	SGBTF Demin - Ins - RCA	-	50	4	6	9	42	-	26	136	136	-	-	128	179	-	-	-	-	17,046	957	-
4a.1.5.46	SGBTF Demin - RCA	-	73	6	11	60	48	-	41	239	239	-	-	850	206	-	-	-	-	48,069	1,427	-
4a.1.5.47	SGBTF Miscellaneous - RCA	-	25	2	4	29	11	-	14	84	84	-	-	408	48	-	-	-	-	19,713	513	-
4a.1.5.48	SGBTF Waste Management	-	62	3	7	62	14	-	29	177	177	-	-	888	60	-	-	-	-	39,969	1,291	-
4a.1.5.49	SGBTF Waste Management - Insulated	-	59	4	6	12	42	-	28	150	150	-	-	165	176	-	-	-	-	18,383	1,184	-
4a.1.5.50	Safety Injection	-	211	71	104	257	673	-	282	1,599	1,599	-	-	3,662	2,868	-	-	-	-	337,806	4,408	-
4a.1.5.51	Safety Injection - Insulated	-	784	105	128	163	929	-	482	2,591	2,591	-	-	2,318	3,935	-	-	-	-	355,016	14,927	-
4a.1.5.52	Sampling	-	9	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	-	236	-
4a.1.5.53	Sampling - Insulated	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	-	328	-
4a.1.5.54	Sampling - Insulated - RCA	-	34	4	4	4	31	-	18	95	95	-	-	56	131	-	-	-	-	10,932	597	-
4a.1.5.55	Sampling - RCA	-	29	3	3	7	23	-	15	80	80	-	-	101	97	-	-	-	-	10,509	535	-
4a.1.5.56	Secondary Side Wet Layup	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	-	308	-
4a.1.5.57	Secondary Side Wet Layup - Ins	-	15	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	-	399	-
4a.1.5.58	Service & Instrument Air	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	-	485	-
4a.1.5.59	Service & Instrument Air - Ins	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	-	258	-
4a.1.5.60	Sodium Hypochlorite	-	47	-	-	-	-	-	7	54	-	-	54	-	-	-	-	-	-	-	1,137	-
4a.1.5.61	Steam Gen Blowdown Cooling	-	17	-	-	-	-	-	3	19	-	-	19	-	-	-	-	-	-	-	387	-
4a.1.5.62	Steam Gen Blowdown Cooling - Ins - RCA	-	57	8	13	60	70	-	43	251	251	-	-	849	296	-	-	-	-	54,068	1,117	-
4a.1.5.63	Steam Gen Blowdown Cooling - Insulated	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	47	-
4a.1.5.64	Steam Gen Blowdown Cooling - RCA	-	76	11	18	81	97	-	59	343	343	-	-	1,153	412	-	-	-	-	74,067	1,473	-
4a.1.5.65	Steam Generator Blowdown	-	24	2	3	6	17	-	12	63	63	-	-	87	70	-	-	-	-	8,152	515	-

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Disposal of Plant Systems (continued)																						
4a.1.5.66	Steam Generator Blowdown - Insulated	-	57	4	6	11	40	-	27	145	145	-	-	162	170	-	-	-	-	17,803	1,145	-
4a.1.5.67	Turbine	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	29	-
4a.1.5.68	Turbine Cooling Water	-	61	-	-	-	-	-	9	70	-	-	70	-	-	-	-	-	-	-	1,431	-
4a.1.5.69	Turbine Cooling Water - Insulated	-	42	-	-	-	-	-	6	49	-	-	49	-	-	-	-	-	-	-	1,050	-
4a.1.5.70	Turbine Lube Oil & Diesel Oil	-	64	-	-	-	-	-	10	73	-	-	73	-	-	-	-	-	-	-	1,468	-
4a.1.5	Totals	-	9,254	441	643	2,011	3,907	-	3,157	19,414	12,796	-	6,617	28,630	16,609	-	-	-	-	2,260,095	203,302	-
4a.1.6	Scaffolding in support of decommissioning	-	732	16	6	58	15	-	198	1,025	1,025	-	-	739	65	-	-	-	-	37,585	18,288	-
4a.1	Subtotal Period 4a Activity Costs	173	23,847	14,637	6,501	4,697	33,514	485	23,019	106,873	100,256	-	6,617	73,077	55,904	751	393	2,886	8,169,579	337,508	5,057	
Period 4a Additional Costs																						
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,371	411	1,782	1,782	-	-	-	-	-	-	-	-	-	25,912	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,371	411	1,782	1,782	-	-	-	-	-	-	-	-	-	25,912	-
Period 4a Collateral Costs																						
4a.3.1	Process decommissioning water waste	5	-	8	36	-	34	-	17	101	101	-	-	-	82	-	-	-	-	4,926	16	-
4a.3.3	Small tool allowance	-	259	-	-	-	-	-	39	298	268	-	30	-	-	-	-	-	-	-	-	-
4a.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	125	12	137	137	-	-	-	-	-	-	-	-	-	-	-
4a.3.5	Fixed Overhead	-	-	-	-	-	-	1,005	151	1,155	1,155	-	-	-	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	5	259	8	36	-	34	1,129	219	1,691	1,661	-	30	-	82	-	-	-	-	4,926	16	-
Period 4a Period-Dependent Costs																						
4a.4.1	Decon supplies	66	-	-	-	-	-	-	16	82	82	-	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	526	53	578	578	-	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	44	4	49	44	-	5	-	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	2,032	-	-	-	-	-	508	2,540	2,540	-	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,959	-	-	-	-	-	444	3,402	3,402	-	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	76	23	-	276	-	80	455	455	-	-	-	3,877	-	-	-	-	77,547	126	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	3,557	534	4,090	4,090	-	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	529	53	581	581	-	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	503	75	578	578	-	-	-	-	-	-	-	-	-	-	-
4a.4.10	NEI Fees	-	-	-	-	-	-	452	45	497	497	-	-	-	-	-	-	-	-	-	-	-
4a.4.11	Security Staff Cost	-	-	-	-	-	-	2,014	302	2,316	2,316	-	-	-	-	-	-	-	-	-	-	54,600
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	14,784	2,218	17,002	17,002	-	-	-	-	-	-	-	-	-	-	176,514
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	22,449	3,367	25,817	25,817	-	-	-	-	-	-	-	-	-	-	306,202
4a.4	Subtotal Period 4a Period-Dependent Costs	66	4,991	76	23	-	276	44,858	7,699	57,988	57,983	-	5	-	3,877	-	-	-	-	77,547	126	537,316
4a.0	TOTAL PERIOD 4a COST	244	29,097	14,721	6,560	4,697	33,824	47,842	31,349	168,334	161,682	-	6,652	73,077	59,864	751	393	2,886	8,252,051	363,562	542,373	
<b>PERIOD 4b - Site Decontamination</b>																						
Period 4b Direct Decommissioning Activities																						
4b.1.1	Remove spent fuel racks	451	50	183	132	-	1,062	-	542	2,420	2,420	-	-	-	4,513	-	-	-	-	298,275	1,243	-
Disposal of Plant Systems																						
4b.1.2.1	Contnmnt Spray & Refueling Water	-	409	133	196	318	1,376	-	537	2,969	2,969	-	-	4,526	5,919	-	-	-	-	570,426	8,830	-
4b.1.2.2	Contnmnt Spray & Refueling Water - Ins	-	174	41	62	57	461	-	181	976	976	-	-	816	1,958	-	-	-	-	162,673	3,648	-
4b.1.2.3	Electrical - Contaminated	-	459	23	41	124	252	-	205	1,103	1,103	-	-	1,762	1,073	-	-	-	-	142,482	8,866	-
4b.1.2.4	Electrical - Decontaminated	-	3,205	211	373	1,133	2,287	-	1,620	8,830	8,830	-	-	16,129	9,719	-	-	-	-	1,297,399	59,268	-
4b.1.2.5	Emergency Diesel Generator	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	-	2,134	-
4b.1.2.6	Emergency Diesel Generator - Insulated	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	-	221	-
4b.1.2.7	Fire Protection - Insulated - RCA	-	5	0	1	3	4	-	3	17	17	-	-	49	19	-	-	-	-	3,226	93	-
4b.1.2.8	Fire Protection - RCA	-	54	5	9	40	50	-	34	193	193	-	-	576	210	-	-	-	-	37,330	1,069	-
4b.1.2.9	Fuel Pool	-	116	23	33	27	252	-	103	555	555	-	-	384	1,069	-	-	-	-	86,300	2,324	-
4b.1.2.10	Fuel Pool - Insulated	-	70	10	13	6	98	-	46	243	243	-	-	81	417	-	-	-	-	30,951	1,352	-
4b.1.2.11	HVAC - Contaminated	-	1,609	68	179	1,651	406	-	785	4,697	4,697	-	-	23,493	1,725	-	-	-	-	1,068,102	29,530	-
4b.1.2.12	Primary Water	-	146	21	34	78	228	-	112	620	620	-	-	1,114	997	-	-	-	-	109,217	3,068	-
4b.1.2.13	Primary Water - Insulated	-	3	0	0	0	3	-	1	7	7	-	-	1	11	-	-	-	-	746	52	-
4b.1.2.14	Radiation Monitoring	-	21	1	1	1	10	-	8	44	44	-	-	18	44	-	-	-	-	3,646	451	-
4b.1.2.15	Reactor Coolant - Insulated	-	68	8	9	7	65	-	36	192	192	-	-	98	275	-	-	-	-	22,195	1,442	-
4b.1.2.16	Refueling Equipment	-	135	13	24	63	150	-	85	470	470	-	-	890	637	-	-	-	-	78,238	2,951	-
4b.1.2.17	Secondary Side Wet Layup - Ins - RCA	-	14	2	2	2	14	-	8	41	41	-	-	33	59	-	-	-	-	5,240	240	-
4b.1.2.18	Secondary Side Wet Layup - RCA	-	13	1	2	9	10	-	8	44	44	-	-	133	43	-	-	-	-	8,247	241	-
4b.1.2.19	Service & Instrument Air - Ins - RCA	-	46	4	5	6	35	-	22	117	117	-	-	81	146	-	-	-	-	13,020	890	-

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4b.1.2.20	Service & Instrument Air - RCA	-	28	3	3	3	22	-	14	72	72	-	-	40	92	-	-	-	7,706	550	-
4b.1.2.21	Spent Fuel	-	11	2	3	3	22	-	9	50	50	-	-	39	94	-	-	-	7,778	227	-
4b.1.2.22	Spent Fuel - Ins	-	2	0	0	-	2	-	1	5	5	-	-	-	8	-	-	-	516	27	-
4b.1.2.23	Waste Management	-	678	101	140	229	978	-	479	2,605	2,605	-	-	3,264	4,230	-	-	-	407,223	13,429	-
4b.1.2.24	Waste Management - Insulated	-	1,306	185	191	9	1,529	-	757	3,979	3,979	-	-	133	6,470	-	-	-	434,869	23,719	-
4b.1.2	Totals	-	8,664	857	1,322	3,770	8,253	-	5,069	27,935	27,827	-	108	53,662	35,213	-	-	-	4,497,532	164,620	-
4b.1.3	Scaffolding in support of decommissioning	-	1,097	24	10	86	23	-	297	1,537	1,537	-	-	1,109	98	-	-	-	56,378	27,432	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	976	1,259	65	850	221	1,723	-	1,401	6,495	6,495	-	-	3,150	21,310	-	-	-	1,822,182	42,437	-
4b.1.4.2	Primary Water Tank & Pump - Contaminated	0	4	1	13	-	18	-	7	42	42	-	-	-	291	-	-	-	25,176	68	-
4b.1.4.3	Reactor Auxiliary	453	149	6	67	70	95	-	308	1,148	1,148	-	-	995	1,464	-	-	-	165,661	12,274	-
4b.1.4.4	Steam Generator Blowdown Treatment	146	29	1	21	2	29	-	91	319	319	-	-	28	476	-	-	-	42,407	3,563	-
4b.1.4.5	Fuel Handling	368	380	5	18	117	26	-	306	1,221	1,221	-	-	1,664	254	-	-	-	88,030	15,213	-
4b.1.4	Totals	1,943	1,822	77	968	410	1,890	-	2,114	9,224	9,224	-	-	5,837	23,795	-	-	-	2,143,455	73,555	-
4b.1	Subtotal Period 4b Activity Costs	2,394	11,633	1,141	2,432	4,267	11,228	-	8,022	41,116	41,008	-	108	60,608	63,618	-	-	-	6,995,640	266,850	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,088	326	1,414	1,414	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,741	822	3,564	3,564	-	-	-	-	-	-	-	-	51,823	-
4b.2.3	Contaminated Soil Remediation	-	1,405	731	5,547	-	14,547	-	4,893	27,123	27,123	-	-	-	948,730	-	-	-	94,873,010	15,812	-
4b.2.4	Soil - Clean Closure	-	-	-	-	-	-	148	22	171	171	-	-	-	-	-	-	-	-	-	-
4b.2.5	Storm Drain Remediation	-	153	60	177	-	425	-	177	992	992	-	-	-	27,763	-	-	-	2,768,792	3,071	-
4b.2.6	Decommissioning of ISFSI	-	339	3	649	-	1,015	1,749	939	4,693	4,693	-	-	-	14,954	-	-	-	2,185,620	12,534	4,650
4b.2.7	Underground Services Excavation	-	1,211	-	-	-	-	542	263	2,016	-	-	2,016	-	-	-	-	-	-	8,000	-
4b.2.8	Operational Equipment	-	-	17	54	506	-	-	86	663	663	-	-	11,710	-	-	-	-	292,750	32	-
4b.2	Subtotal Period 4b Additional Costs	-	3,108	811	6,426	506	15,986	6,268	7,528	40,635	38,619	-	2,016	11,710	991,447	-	-	-	100,120,200	91,273	10,890
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	12	-	18	83	-	78	-	40	230	230	-	-	-	188	-	-	-	11,265	37	-
4b.3.3	Small tool allowance	-	215	-	-	-	-	-	32	247	247	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	129	60	467	124	-	123	903	903	-	-	6,000	529	-	-	-	304,968	88	-
4b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	2,092	209	2,301	2,301	-	-	-	-	-	-	-	-	-	-
4b.3.6	Fixed Overhead	-	-	-	-	-	-	2,009	301	2,310	2,310	-	-	-	-	-	-	-	-	-	-
4b.3	Subtotal Period 4b Collateral Costs	12	215	147	142	467	202	4,101	706	5,992	5,992	-	-	6,000	717	-	-	-	316,233	125	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	911	-	-	-	-	-	-	228	1,139	1,139	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	1,119	112	1,230	1,230	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	88	9	97	97	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	2,452	-	-	-	-	-	613	3,066	3,066	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	6,076	-	-	-	-	-	911	6,987	6,987	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	97	30	-	354	-	103	584	584	-	-	-	4,970	-	-	-	99,392	162	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	5,616	842	6,458	6,458	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,057	106	1,163	1,163	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	1,006	151	1,157	1,157	-	-	-	-	-	-	-	-	-	-
4b.4.10	NEI Fees	-	-	-	-	-	-	903	90	994	994	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	4,027	604	4,631	4,631	-	-	-	-	-	-	-	-	-	109,200
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	29,624	4,444	34,068	34,068	-	-	-	-	-	-	-	-	-	348,400
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	46,416	6,962	53,379	53,379	-	-	-	-	-	-	-	-	-	613,600
4b.4	Subtotal Period 4b Period-Dependent Costs	911	8,529	97	30	-	354	89,858	15,175	114,953	114,953	-	-	-	4,970	-	-	-	99,392	162	1,071,200
4b.0	TOTAL PERIOD 4b COST	3,318	23,485	2,197	9,030	5,240	27,770	100,227	31,431	202,697	200,573	-	2,124	78,318	1,060,752	-	-	-	107,531,400	358,410	1,082,090
<b>PERIOD 4f - License Termination</b>																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	165	49	214	214	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	165	49	214	214	-	-	-	-	-	-	-	-	-	-

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/ Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours		
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet					
Period 4f Additional Costs																							
4f.2.1	License Termination Survey	-	-	-	-	-	-	5,182	1,555	6,737	6,737	-	-	-	-	-	-	-	-	-	97,204	3,120	
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	5,182	1,555	6,737	6,737	-	-	-	-	-	-	-	-	-	97,204	3,120	
Period 4f Collateral Costs																							
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,189	178	1,367	1,367	-	-	-	-	-	-	-	-	-	-	-	
4f.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	-	-	
4f.3.3	Fixed Overhead	-	-	-	-	-	-	607	91	698	698	-	-	-	-	-	-	-	-	-	-	-	
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	1,796	269	2,066	2,066	-	-	-	-	-	-	-	-	-	-	-	
Period 4f Period-Dependent Costs																							
4f.4.2	Property taxes	-	-	-	-	-	-	27	3	29	29	-	-	-	-	-	-	-	-	-	-	-	
4f.4.3	Health physics supplies	-	460	-	-	-	-	-	115	575	575	-	-	-	-	-	-	-	-	-	-	-	
4f.4.4	Disposal of DAW generated	-	-	5	1	-	18	-	5	29	29	-	-	-	247	-	-	-	-	4,938	8	-	
4f.4.5	Plant energy budget	-	-	-	-	-	-	453	68	520	520	-	-	-	-	-	-	-	-	-	-	-	
4f.4.6	NRC Fees	-	-	-	-	-	-	307	31	338	338	-	-	-	-	-	-	-	-	-	-	-	
4f.4.7	NEI Fees	-	-	-	-	-	-	273	27	300	300	-	-	-	-	-	-	-	-	-	-	-	
4f.4.8	Security Staff Cost	-	-	-	-	-	-	495	74	569	569	-	-	-	-	-	-	-	-	-	-	11,786	
4f.4.9	DOC Staff Cost	-	-	-	-	-	-	3,882	582	4,464	4,464	-	-	-	-	-	-	-	-	-	-	46,750	
4f.4.10	Utility Staff Cost	-	-	-	-	-	-	4,693	704	5,397	5,397	-	-	-	-	-	-	-	-	-	-	56,964	
4f.4	Subtotal Period 4f Period-Dependent Costs	-	460	5	1	-	18	10,129	1,609	12,222	12,222	-	-	-	247	-	-	-	-	4,938	8	115,500	
4f.0	TOTAL PERIOD 4f COST	-	460	5	1	-	18	17,272	3,483	21,239	21,239	-	-	-	247	-	-	-	-	4,938	97,212	118,620	
<b>PERIOD 4 TOTALS</b>		<b>3,561</b>	<b>53,042</b>	<b>16,923</b>	<b>15,592</b>	<b>9,937</b>	<b>61,612</b>	<b>165,341</b>	<b>66,262</b>	<b>392,270</b>	<b>383,494</b>	<b>-</b>	<b>8,776</b>	<b>151,395</b>	<b>1,120,862</b>	<b>751</b>	<b>393</b>	<b>2,886</b>	<b>115,788,400</b>	<b>819,184</b>	<b>1,743,083</b>		
<b>PERIOD 5b - Site Restoration</b>																							
Period 5b Direct Decommissioning Activities																							
Demolition of Remaining Site Buildings																							
5b.1.1.1	Reactor	-	7,922	-	-	-	-	-	1,188	9,111	-	-	9,111	-	-	-	-	-	-	-	-	114,134	-
5b.1.1.2	Intake Structure & CWS	-	669	-	-	-	-	-	100	769	-	-	769	-	-	-	-	-	-	-	-	9,031	-
5b.1.1.3	Miscellaneous Structures	-	5,301	-	-	-	-	-	795	6,096	-	-	6,096	-	-	-	-	-	-	-	-	74,756	-
5b.1.1.4	Primary Water Tank & Pump - Contaminated	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	-	48	-
5b.1.1.5	Reactor Auxiliary	-	1,788	-	-	-	-	-	268	2,056	-	-	2,056	-	-	-	-	-	-	-	-	22,733	-
5b.1.1.6	Security Improvements	-	245	-	-	-	-	-	37	282	-	-	282	-	-	-	-	-	-	-	-	2,317	-
5b.1.1.7	Steam Generator Blowdown Treatment	-	535	-	-	-	-	-	80	615	-	-	615	-	-	-	-	-	-	-	-	7,492	-
5b.1.1.8	Turbine	-	1,098	-	-	-	-	-	165	1,263	-	-	1,263	-	-	-	-	-	-	-	-	17,649	-
5b.1.1.9	Turbine Pedestal	-	821	-	-	-	-	-	123	945	-	-	945	-	-	-	-	-	-	-	-	8,825	-
5b.1.1.10	Fuel Handling	-	1,054	-	-	-	-	-	158	1,212	-	-	1,212	-	-	-	-	-	-	-	-	14,207	-
5b.1.1	Totals	-	19,436	-	-	-	-	-	2,915	22,351	-	-	22,351	-	-	-	-	-	-	-	-	271,192	-
Site Closeout Activities																							
5b.1.2	Remove Rubble	-	1,033	-	-	-	-	-	155	1,188	-	-	1,188	-	-	-	-	-	-	-	-	5,971	-
5b.1.3	Grade & landscape site	-	489	-	-	-	-	-	73	563	-	-	563	-	-	-	-	-	-	-	-	1,141	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	80	12	92	92	-	-	-	-	-	-	-	-	-	-	668	-
5b.1	Subtotal Period 5b Activity Costs	-	20,959	-	-	-	-	80	3,156	24,194	24,194	-	24,102	-	-	-	-	-	-	-	-	278,305	668
Period 5b Additional Costs																							
5b.2.1	Concrete Crushing	-	591	-	-	-	-	6	90	687	-	-	687	-	-	-	-	-	-	-	-	3,099	-
5b.2.2	Demolition of ISFSI	-	745	-	-	-	-	28	116	890	-	-	890	-	-	-	-	-	-	-	-	4,137	80
5b.2.3	Circulating Water Diffuser Isolation	-	161	-	-	-	-	-	24	185	-	-	185	-	-	-	-	-	-	-	-	2,151	-
5b.2.4	Intake and Discharge Cofferdams	-	638	-	-	-	-	-	96	734	-	-	734	-	-	-	-	-	-	-	-	5,926	-
5b.2.5	Construction Debris	-	-	-	-	-	-	831	125	956	-	-	956	-	-	-	-	-	-	-	-	-	-
5b.2	Subtotal Period 5b Additional Costs	-	2,136	-	-	-	-	866	450	3,452	-	-	3,452	-	-	-	-	-	-	-	-	15,313	80
Period 5b Collateral Costs																							
5b.3.1	Small tool allowance	-	218	-	-	-	-	-	33	251	-	-	251	-	-	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	218	-	-	-	-	-	33	251	-	-	251	-	-	-	-	-	-	-	-	-	-

**Table D-2**  
**St. Lucie Nuclear Plant, Unit 2**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 5b Period-Dependent Costs																						
5b.4.2	Property taxes	-	-	-	-	-	-	66	7	73	-	-	73	-	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,265	-	-	-	-	-	940	7,204	-	-	7,204	-	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	561	84	645	-	-	645	-	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	1,121	168	1,289	-	-	1,289	-	-	-	-	-	-	-	-	25,838
5b.4.6	DOC Staff Cost	-	-	-	-	-	-	9,297	1,395	10,692	-	-	10,692	-	-	-	-	-	-	-	-	103,274
5b.4.7	Utility Staff Cost	-	-	-	-	-	-	4,252	638	4,889	-	-	4,889	-	-	-	-	-	-	-	-	50,663
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,265	-	-	-	-	15,297	3,231	24,792	-	-	24,792	-	-	-	-	-	-	-	-	179,775
5b.0	TOTAL PERIOD 5b COST	-	29,577	-	-	-	-	16,242	6,870	52,689	92	-	52,598	-	-	-	-	-	-	-	293,618	180,523
<b>PERIOD 5 TOTALS</b>		-	29,577	-	-	-	-	16,242	6,870	52,689	92	-	52,598	-	-	-	-	-	-	-	293,618	180,523
<b>TOTAL COST TO DECOMMISSION</b>		<b>8,511</b>	<b>90,667</b>	<b>17,913</b>	<b>16,784</b>	<b>15,101</b>	<b>62,934</b>	<b>642,137</b>	<b>145,273</b>	<b>999,319</b>	<b>717,305</b>	<b>219,993</b>	<b>62,022</b>	<b>178,412</b>	<b>1,128,561</b>	<b>751</b>	<b>393</b>	<b>2,886</b>	<b>117,429,800</b>	<b>1,191,715</b>	<b>6,033,835</b>	

<b>TOTAL COST TO DECOMMISSION WITH 17.01% CONTINGENCY:</b>	<b>\$999,319</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL NRC LICENSE TERMINATION COST IS 71.78% OR:</b>	<b>\$717,305</b>	<b>thousands of 2015 dollars</b>
<b>SPENT FUEL MANAGEMENT COST IS 22.01% OR:</b>	<b>\$219,993</b>	<b>thousands of 2015 dollars</b>
<b>NON-NUCLEAR DEMOLITION COST IS 6.21% OR:</b>	<b>\$62,022</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):</b>	<b>1,129,705</b>	<b>cubic feet</b>
<b>TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:</b>	<b>2,886</b>	<b>cubic feet</b>
<b>TOTAL SCRAP METAL REMOVED:</b>	<b>45,042</b>	<b>tons</b>
<b>TOTAL CRAFT LABOR REQUIREMENTS:</b>	<b>1,191,715</b>	<b>man-hours</b>

End Notes:  
n/a - indicates that this activity not charged as decommissioning expense.  
a - indicates that this activity performed by decommissioning staff.  
0 - indicates that this value is less than 0.5 but is non-zero.  
a cell containing " - " indicates a zero value

**APPENDIX E**  
**ISFSI DECOMMISSIONING**

**Table E**  
**St. Lucie Nuclear Plant, Units 1 and 2**  
**ISFSI Decommissioning Cost Estimate**  
**DECON and SAFSTOR Decommissioning Alternatives**  
(thousands of 2015 dollars)

Activity Description	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
<b>Decommissioning Contractor</b>									
Planning (characterization, specs and procedures)	-	-	-	-	289	289	-	-	1,264
Decontamination (activated disposition)	678	6	1,297	2,030	-	4,011	29,908	6,914	-
License Termination (radiological surveys)	-	-	-	-	1,915	1,915	-	18,155	-
<b>Subtotal</b>	<b>678</b>	<b>6</b>	<b>1,297</b>	<b>2,030</b>	<b>2,204</b>	<b>6,215</b>	<b>29,908</b>	<b>25,068</b>	<b>1,264</b>
<b>Supporting Costs</b>									
NRC and NRC Contractor Fees and Costs	-	-	-	-	411	411	-	-	776
Florida LLRW Inspection Fee	-	-	-	-	58	58	-	-	-
Insurance	-	-	-	-	136	136	-	-	-
Property taxes	-	-	-	-	24	24	-	-	-
Plant energy budget	-	-	-	-	199	199	-	-	-
Security Staff Cost	-	-	-	-	147	147	-	-	3,457
Oversight Staff	-	-	-	-	318	318	-	-	3,803
<b>Subtotal</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,293</b>	<b>1,293</b>	<b>-</b>	<b>-</b>	<b>8,036</b>
<b>Total (w/o contingency)</b>	<b>678</b>	<b>6</b>	<b>1,297</b>	<b>2,030</b>	<b>3,497</b>	<b>7,508</b>	<b>29,908</b>	<b>25,068</b>	<b>9,300</b>
<b>Total (w/25% contingency)</b>						<b>9,385</b>			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

SECTION 12

COMPARISON REPORT  
Comparative Analysis of Cost Studies  
2010 & 2015 Cost Studies

**COMPARISON REPORT 2010 - 2015**  
**for the**  
**ST. LUCIE NUCLEAR PLANT, UNITS 1 AND 2**



*prepared for*

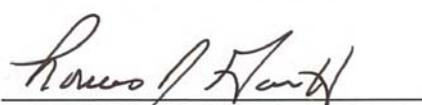
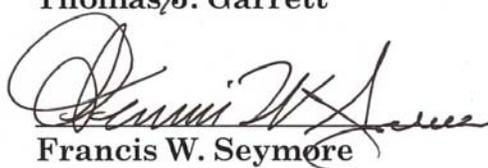
**Florida Power & Light Company**

*prepared by*

**TLG Services, Inc.**  
**Bridgewater, Connecticut**

**November 2015**

APPROVALS

Project Manager	 _____ William A. Cloutier, Jr.	<u>23 Nov 2015</u> Date
Project Engineer	 _____ Thomas J. Garrett	<u>11-23-15</u> Date
Technical Manager	 _____ Francis W. Seymore	<u>11/23/15</u> Date

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**REVISION LOG**

<b>No.</b>	<b>CRA No.</b>	<b>Date</b>	<b>Item Revised</b>	<b>Reason for Revision</b>
0		11-23-2015		Original Issue

## SUMMARY

This document provides a comparative discussion on decommissioning cost estimates prepared for the St. Lucie Nuclear Plant (St. Lucie) in 2010<sup>[1]</sup> and updated in 2015<sup>[2]</sup> by TLG Services, Inc. (TLG). The estimates described in this document were constructed for a prompt decommissioning scenario following the scheduled cessation of operations, recognizing that there is a seven year offset in the scheduled shutdown dates for the two nuclear units. The scope of the two estimates is consistent, including cost elements for license termination, spent fuel management and site restoration activities.

The estimates were generated in 2010 and 2015 dollars, respectively. The 2015, or current estimate, was developed using the basic inventory and plant design information from the 2010, or previous cost model. The data, estimating assumptions and site-specific considerations were reviewed for the 2015 analysis. The cost model was modified where new information was available, updated site-specific information was obtained, or experience from past decommissioning programs justified such changes.

The overall estimate to decommission St. Lucie (for the Integrated DECON alternative) increased 22.2% over the five year period between estimates. The increase (or decrease) in the individual cost elements is shown in Table 1.

The cost elements were assigned to one of three subcategories: *NRC License Termination*, *Spent Fuel Management*, and *Site Restoration*. Delegation of cost elements into these categories was for the purpose of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction or overlap between the activities in the three subcategories.

The subcategory *NRC License Termination* was used to accumulate costs that are consistent with the NRC's definition of decommissioning in its financial assurance regulations (i.e., 10 CFR Part 50.75). The cost reported for this subcategory is generally sufficient to terminate the operating licenses for the two reactors, recognizing that there may be some additional cost impact from spent fuel management. The cost associated with St. Lucie license termination activities increased 14.8% over the five years or approximately 2.8% annually. License

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<sup>1</sup> "Decommissioning Cost Analysis for the St. Lucie Nuclear Plant, Units 1 and 2," TLG Document F02-1630-001, Rev. 0, dated December 2010

<sup>2</sup> "Decommissioning Cost Analysis for the St. Lucie Nuclear Plant, Units 1 and 2," TLG Document F02-1714-001, Rev. 0, dated November 2015

termination costs were most impacted by one time changes in the security organization, waste disposal rates for the higher activity radioactive waste and additional resources assigned to oversee site remediation and waste characterization activities, as well as, expenses associated with the site decommissioning organization (for example, non-labor costs).

The *Spent Fuel Management* subcategory contains costs anticipated to be incurred once the nuclear units cease operation for the off-loading of the pools either directly to the Department of Energy (DOE) or to the Independent Spent Fuel Storage Installation (ISFSI) for interim storage, and the eventual transfer of fuel from the ISFSI to the DOE. Costs were also included for the operation of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., geologic repository or interim facility) is complete. The costs assigned to this subcategory increased 47.0% over the five years. Significant increases in campaign costs for transfer of spent fuel from the pool to the DOE and ISFSI accounted for a majority of the increase.

*Site Restoration* was used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet below grade and backfilled to conform to local grade. The costs assigned to this subcategory increased 16.9% over the five years. The increase is the result of higher security and energy costs, and the inclusion of additional heavy equipment to support demolition activities.

	<b>2010</b>	<b>2015</b>	<b>Delta</b>	<b>Percent</b>	<b>Annual</b>
<b>Cost Center</b>	<b>(\$1000s)</b>	<b>(\$1000s)</b>	<b>(\$1000s)</b>	<b>Change</b>	<b>Change</b>
License Termination	1,052,235	1,208,237	156,002	14.8	2.8
Spent Fuel Management	331,105	486,705	155,600	47.0	8.0
Site Restoration	95,414	111,537	16,123	16.9	3.2
<b>Total</b>	<b>1,478,754</b>	<b>1,806,479</b>	<b>327,725</b>	<b>22.2</b>	<b>4.1</b>

The rationale for specific changes in several major cost centers is discussed in more detail within the following narrative. Comparisons are focused on permutations in the technical work scope and modifications to assumptions that have affected the cost of decommissioning. Inflationary effects, while a factor, are generally ignored for purposes of this analysis.

## COMPARATIVE ANALYSIS

TLG completed a decommissioning cost analysis for St. Lucie in 2010. The analysis provided the Florida Power & Light Company (FPL), the owner and operator of the nuclear units, with the projected costs (in 2010 dollars) to completely decontaminate and dismantle the station following the normal cessation of plant operations. For purposes of this comparison, this analysis is referred to as the 2010 estimate or previous analysis.

In 2015, TLG updated the cost analysis for FPL. The current analysis uses the physical plant inventory and design information from the previous analysis. This data was reviewed, along with the assumptions and other site-specific considerations, and modified or updated where new information was available or experience from ongoing decommissioning programs justified such changes. Since the update relied upon 2015 economic data, the analysis is referred to as the 2015 estimate or current analysis.

Generally, escalation of the various cost components in a decommissioning analysis (with the exception of those costs associated with radioactive waste disposal), follows "standard" cost indices. However, such indices can only be applied successfully to a static model, *i.e.*, where the bases against which the indices are applied have not undergone significant change. In the period between the last two analyses (the 2010 and 2015 financial years), new cost elements have been added and older cost elements revised. With this in mind, the following discussion encompasses the major areas of difference between the two estimates.

In 2010, the estimate to promptly decommission St. Lucie (DECON alternative) was estimated at approximately \$1,478.8 million (in 2010 dollars). The comparable cost in 2015 is \$1,806.5 million (in 2015 dollars). This represents a 22.2% increase in the overall cost. Major areas of change in the two estimates are shown in Table 1.

The decommissioning scope of the current cost estimate has not significantly changed from that evaluated presented in 2010.

1. Program Management and Security

The organization identified to oversee the decommissioning project and manage the day-to-day activities is similar in structure to the operating organization, although much reduced in size and function.

The cost category includes several contributors:

- Plant Staff: comprised of the decision-making individuals at the site, administrative, secretarial and/or clerical support, plant management responsible for the facility's operation, maintenance, as well as compliance with the existing operating license and technical specifications during the initial preparation phase, quality assurance and quality surveillance, engineering support, planning and cost control personnel, health physics and radiation protection, industrial safety, waste management, procurement, document control, and field superintendents for work force direction
- Engineering: supplemental workforce employed in the preparation stages to support the reconfiguration of the plant for decommissioning, develop specifications, procedures and work packages for both in-house and subcontracted activities, and perform related studies and supporting analyses
- Security: personnel comprising the on-site, plant security force including surveillance personnel, access/egress control and processing personnel, a rapid response contingent, training and supervisory personnel
- Decommissioning Operations Contractor (DOC): organization contracted to manage the execution of the decontamination and dismantling activities including direct supervision of trades and oversight of subcontractors engaged in specialty activities such as reactor vessel segmentation

Table 2 provides a comparison of the Plant and DOC peak staffing levels for each decommissioning period and corresponding cost per month. Staffing levels are relatively consistent for the major decommissioning periods.

A general increase in wages and benefits over the five year period is the primary contributor to the 14.0% increase in Plant and DOC organizational costs of \$69.2 million.

The length of the decommissioning schedule (from the cessation of operations to the termination of the site licenses) in the 2015 cost model is unchanged from the 2010 schedule (Table 3).

In January 2007, the NRC approved a final rule that enhanced its security regulations governing the design basis threat (DBT). This rule imposed security requirements similar to those previously imposed by the Commission's April 29, 2003, DBT Orders. However, the new rule also modified and enhanced the DBT based on experience and insights gained by the Commission during implementation of the Orders, and extensive consideration of the factors specified in the Energy Policy Act of 2005.

Based upon the industry's response to the NRC's rulemaking, and input from active decommissioning projects (for example, Vermont Yankee), the security cost model was adjusted to increase the number of security personnel over the project duration (Table 4). An increase of approximately 14% in the hourly guard rate also contributed to the overall 64.6% increase of \$71.2 million in security costs.

2. Spent Fuel Management (ISFSI Related)

For purposes of generating a comprehensive post-shutdown cost, the cost to manage the spent fuel generated over the operating life of St. Lucie was included within the decommissioning estimate until such time that the DOE can complete the transfer of the assemblies off-site. The current (2015) analysis assumes that the DOE will begin the process of removing spent fuel from the St. Lucie site in 2032 (based upon a 2030 industry-wide start date). The process is expected to be completed by the year 2073. The schedule is unchanged from 2010 (Table 5).

Slight decreases in the costs for the dry storage modules (HSMs and DSCs) and cask loading were off-set by significant increases in campaign costs for transfer of spent fuel from the pool to the DOE and/or ISFSI. The increase in campaign costs accounted for a majority of the 30.3% increase of \$65.4 million.

Unit Costs (each)	2010	2015
Dry Storage Canister (DSC)	\$900,000	\$823,698
Horizontal Storage Module (HSM)	\$483,000	\$431,230
Cask Loading/Transfer Cost	\$575,000	\$392,600
Pool to DOE Campaign Cost (per campaign)	\$175,000	\$3,280,100
Pool to ISFSI Campaign Cost (per campaign)	\$350,000	\$3,280,100
ISFSI Unloading Cost	\$100,000	\$196,300
ISFSI Unloading Campaign Cost	\$0	\$820,025

3. Low-Level Radioactive Waste Disposal

Consistent with the 2010 estimates, the current cost model assumes that the majority of the low-level radioactive waste requiring controlled disposal (Class A as defined by 10 CFR §61.55) is sent to EnergySolutions' facility in Clive, Utah.

Disposal costs for Class A waste were based upon FPL's Life of Plant Agreement with EnergySolutions. There was a nominal increase in disposal rates. The waste inventory, against which the disposal rates are applied, was increased with a one-time change in the packaging density for containerized waste.

EnergySolutions is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream. In 2010, for estimating purposes, rates for the Barnwell facility were used (even though FPL did not have access to the site). Since that time, the Texas Compact opened a new disposal facility that is licensed to receive Class B and C waste. The disposal site, operated by Waste Control Specialists, is able to receive limited quantities of waste from non-Compact generators. As such, the 2015 estimates for Class B and C disposal were based upon available rate information for the Texas facility.

The 14.9% increase in waste disposal costs (\$23.1 million) is due to the escalation of EnergySolutions rates as well as the change in the cost basis for the disposal of Class B and C waste. Also contributing to the increase was additional biological shield concrete being designated for controlled disposal and the disposition of the horizontal storage modules used to store fuel and targeted for remediation.

4. Removal

Contract labor is used to decontaminate, remove, and package the plant inventory, as well as to support the dismantling and demolition of the physical structures. The dismantling process is labor-intensive and the cost model assumes that a common laborer performs a majority of the required tasks, with support from the various skilled trades. While wage rates for the craft, as shown in Table 7, did not significantly increase over the five year period, the hours expended for the additional work scope (for example, containment concrete) did increase, approximately 10%. Approximately half of the total increase in the "Removal" cost category was due to a change (increase) in the heavy equipment assigned to the project.

5. Insurance and Regulatory Fees

The 2010 estimates included provisions for both nuclear liability and property insurance throughout the active decommissioning phase. Operating premiums were reduced once the units ceased operation based upon the guidance and the limits for coverage defined in the NRC’s proposed rulemaking “Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors.” The operating premiums for the two policies are shown below for both the 2010 and 2015 timeframes.

Despite higher starting premiums in 2015, the property component was significantly reduced shortly after plant shutdown in the 2015 cost model, based upon planning experience at Vermont Yankee. The decrease in property insurance costs was offset by an increase in the liability insurance, particularly during the ISFSI operating period, due to a change in modeling assumptions.

NRC fees are associated with the Part 50 operating license(s) and for the oversight and regulatory review anticipated (based upon industry experience) for a decommissioning project. As shown below, the annual licensing cost has increased over the past five years, as well as the hourly rate increased.

Emergency planning fees are included while spent fuel remains on site. FEMA fees are discontinued shortly after the cessation of operations and defueling. However, state fees are applied until such time that the fuel has been removed from the site.

Annual Cost (per unit)	2010	2015
Nuclear Liability Insurance Premium	\$574,257	\$776,707
Nuclear Property Insurance Premium <sup>[1]</sup>	\$2,519,000	\$3,870,000
NRC License Fee	\$122,000	\$237,000
Annual Cost (site)	2010	2015
Emergency Planning Fee (state and county)	\$816,808	\$917,488
Other	2010	2015
NRC Hourly Rate (e.g., for reviews, inspections)	\$257	\$268

<sup>[1]</sup> Both Units Operating Primary Premium

6. Transportation

It was assumed in both the 2010 and 2015 cost models that the majority of the low-level radioactive waste requiring controlled disposal (Class A) would be sent to EnergySolutions' burial facility in Clive, Utah. The 8.0% increase in transportation costs is due to a combination of higher tariffs, fuel surcharges and the additional shipments associated with the larger number of waste packages and the contaminated concrete.

7. Energy

Energy costs are included for critical plant systems, temporary power, offices and other facilities housing site personnel, security and other site services. The increase in energy costs in the 2015 estimate is a direct result of the purchase power rate increasing from \$.117 per kilowatt hour in 2010 to \$.158 per kilowatt hour in 2015.

8. Packaging

Several factors contributed to the increased packaging costs. The 2015 cost model assumed a lower waste packaging density than the prior study (based upon industry experience). The change increased the number of packages required for the plant equipment and commodities designated for controlled disposal.

The costs for packaging the reactor vessel internals, specifically the GTCC material, also increased (GTCC is packaged in the same containers used for spent fuel - dry shielded canisters and horizontal storage modules). The number of GTCC canisters increased in the 2015 cost model due assumed reduction in the canister's payload capacity (based upon Maine Yankee experience).

9. Property Taxes

Property taxes are included as a site operating cost during decommissioning. The 2010 estimate assumed that taxes would continue to be assessed on existing plant structures and equipment until they were physically removed. By comparison, the 2015 estimate assumes no significant value for the site structures and includes only a value on the land (protected area) during active decommissioning and only on ISFSI footprint thereafter.

Property taxes decreased \$10.7 million in the 2015 estimate (Table 1), as a result of a change in how the tax would be assessed.

10. Off-Site Waste Processing

Off-site waste processing rates as provided in the EnergySolutions contract decreased between 2010 and 2015. The reduction in rates accounts for the majority of the \$8.3 million decrease in costs (since the total volume has essentially remained unchanged).

11. Site Characterization and License Termination Surveys

The 2015 analysis included the addition of a remedial action survey program (incorporating industry experience) in support of decontamination and dismantling work. This activity accounted for \$11.8 million of the \$18.9 million increase. Characterization and license termination survey cost also increased with higher labor (for example, health physics technicians) and material cost increases.

12. Spent Fuel Pool Isolation

The isolation cost includes the engineering, facility modifications, and the capital improvements necessary to segregate the pool areas and reduce the protected boundary, so that decommissioning operations can proceed expeditiously. The 2015 value for this cost element represents an annual increase of 2% over the five year period.

13. Fixed Overhead

Overhead charges were updated from the 2010 estimate, resulting in a \$9.5 million dollar increase. The annual site cost as provided for St. Lucie increased from approximately \$836 thousand in 2010 to \$1.6 million in 2015. The increase was applied across the active decommissioning periods.

**TABLE 1  
COST COMPARISON  
INTEGRATED DECON ALTERNATIVE**

<b>Cost Center</b>	<b>2010 (\$1000s)</b>	<b>2015 (\$1000s)</b>	<b>Delta (\$1000s)</b>	<b>Percent Change</b>	<b>Annual Change</b>
Decontamination	26,001	28,048	2,047	7.9	1.5
Removal <sup>[1]</sup>	182,608	215,703	33,095	18.1	3.4
Packaging	41,172	59,248	18,076	43.9	7.6
Transportation	43,036	46,466	3,430	8.0	1.5
Radioactive Waste Disposal	155,092	178,181	23,089	14.9	2.8
Off-site Waste Processing	41,466	33,126	-8,340	-20.1	-4.4
Program Management <sup>[2]</sup>	493,640	562,822	69,180	14.0	2.7
Security	110,281	181,472	71,191	64.6	10.5
Spent Fuel Pool Isolation	19,129	21,250	2,121	11.1	2.1
Spent Fuel Management <sup>[3]</sup>	215,599	280,964	65,365	30.3	5.4
Insurance and Regulatory Fees	35,567	47,247	11,680	32.8	5.8
Energy	34,447	46,828	12,381	35.9	6.3
Characterization/Surveys	24,248	43,144	18,896	77.9	12.2
Property Taxes	21,167	10,493	-10,674	-50.4	-13.1
Misc. Equip / Site Services	14,894	16,783	1,889	12.7	2.4
Fixed Overhead	9,918	19,387	9,469	95.5	14.3
INPO , NEI Fees	5,557	10,187	4,630	83.3	12.9
Florida LLRW Inspection Fee	4,932	5,130	198	4.0	0.8
<b>Total <sup>[4]</sup></b>	<b>1,478,754</b>	<b>1,806,479</b>	<b>327,725</b>	<b>22.2</b>	<b>4.1</b>

<b>Cost Center</b>	<b>2010 (\$1000s)</b>	<b>2015 (\$1000s)</b>	<b>Delta (\$1000s)</b>	<b>Percent Change</b>	<b>Annual Change</b>
License Termination	1,052,235	1,208,237	156,002	14.8	2.8
Spent Fuel Management <sup>[5]</sup>	331,105	486,705	155,600	47.0	8.0
Site Restoration	95,414	111,537	16,123	16.9	3.2
<b>Total <sup>[4]</sup></b>	<b>1,478,754</b>	<b>1,806,479</b>	<b>327,725</b>	<b>22.2</b>	<b>4.1</b>

<sup>[1]</sup> Includes miscellaneous equipment costs

<sup>[2]</sup> Includes engineering costs

<sup>[3]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[4]</sup> Columns may not add due to rounding

<sup>[5]</sup> Includes period-dependent costs such as Program Management costs

**TABLE 2**  
**DECOMMISSIONING STAFFING COMPARISON**

		<b>2010</b>	<b>2010</b>	<b>2015</b>	<b>2015</b>
		<b>Peak</b>	<b>Peak</b>	<b>Peak</b>	<b>Peak</b>
		<b>Staffing</b>	<b>Cost/Month</b>	<b>Staffing</b>	<b>Cost/Month</b>
		<b>(persons)</b>	<b>(\$1000s)</b>	<b>(persons)</b>	<b>(\$1000s)</b>
<b>Unit 1</b>					
Period 1					
Safe-Storage	FPL	203	2,301	203	2,590
	DOC	0	0	0	0
Period 2					
Dormancy	FPL	40	475	40	537
	DOC	0	0	0	0
Period 3					
Preparations	FPL	96	1,062	96	1,200
	DOC	41	531	41	578
Period 4					
Decommissioning	FPL	123	1,409	123	1,603
	DOC	69	917	69	1,007
Period 5					
Site Restoration	FPL	13	167	13	190
	DOC	27	372	27	415
<b>Unit 2</b>					
Period 1					
Preparations	FPL	204	2,314	204	2,604
	DOC	61	829	61	902
Period 2					
Decommissioning	FPL	141	1,634	142	1,868
	DOC	76	1,034	76	1,134
Period 3					
Site Restoration	FPL	17	212	17	241
	DOC	27	372	27	415

**TABLE 3  
 PROJECT SCHEDULE COMPARISON**

	<b>2010</b>	<b>2015</b>
	<b>(months)</b>	<b>(months)</b>
<b>Unit 1</b>		
Period 1 – Safe-Storage	18	18
Period 2 – Dormancy	80	80
Period 3 – Preparations	18	18
Period 4 – Decommissioning Operations	51	53
Period 5 – Site Restoration	22	22
ISFSI Operations	265	263
ISFSI Decommissioning and Demolition	6	6
<b>TOTAL</b>	460	460
<b>Unit 2</b>		
Period 1 – Preparations	18	18
Period 2 – Decommissioning Operations	63	65
Period 3 – Site Restoration	22	22
ISFSI Operations	265	263
ISFSI Decommissioning and Demolition	6	6
<b>TOTAL</b>	375	375

**TABLE 4  
SECURITY FORCE COMPARISON**

	<b>2010</b>	<b>2015</b>
	<b>Peak Guard Force</b>	
	<i>(no. of full-time equivalents)</i>	
<b>Unit 1</b>		
Period 1 – Safe-Storage	22.4 <sup>[1]</sup>	70.5
Period 2 – Dormancy	5.3	43.0
Period 3 – Preparations	3.0	18.0
Period 4 – Decommissioning Operations	17.8	21.0
Period 5 – Site Restoration <sup>[2]</sup>	16.9	21.0
ISFSI Operations	13.5	15.5
ISFSI Decommissioning and Demolition	3.6	2.5
<b>Unit 2</b>		
Period 1 – Preparations	75.5	70.5
Period 2 – Decommissioning Operations	63.3	60.5
Period 3 – Site Restoration <sup>[2]</sup>	16.9	21.0
ISFSI Operations	13.5	15.5
ISFSI Decommissioning and Demolition	3.6	2.5

Notes:

1. Unit 1 was assigned a supplemental guard force until such time that Unit 2 ceased operations (i.e., Unit 2 was responsible for site security during active plant operations)
2. The guard force is allocated equally between the units during Site Restoration and the ISFSI Operations period

**TABLE 5  
SPENT FUEL VARIABLES**

	<b>2010</b>	<b>2015</b>
DOE Start Date (year)	2030	2030
DSC's or TADs Required to Empty Spent Fuel Pools		
DOE Direct (TADs)	51	51
ISFSI (DSCs)	47	50
Maximum Number of HSMs on ISFSI	132	129
Final Year of DOE Pickup	2073	2073
ISFSI Operating Period (post-Unit 2 shutdown) (years)	30	30
GTCC Canisters	8	14

Notes:

1. GTCC canister total includes an additional modified DSC (per unit) for the material classified as GTCC residing in the spent fuel pools
2. The payload capacity of the GTCC canister was reduced in the 2015 cost study based upon Maine Yankee experience, i.e., additional canisters were required for the same mass

**TABLE 6  
DECOMMISSIONING WASTE SUMMARY**

				<b>2010</b>	<b>2015</b>
Waste Class	Waste Form	Cost Basis	Class <sup>[1]</sup>	Waste Volume (cubic feet)	Waste Volume (cubic feet)
Low-Level Radioactive Waste (at near-surface disposal facility)	Containerized and Bulk Debris	EnergySolutions	A	232,794	326,508
		WCS	B	1,984	1,982
		WCS	C	804	785
	Contaminated Soil	EnergySolutions <sup>[2]</sup>	A	1,969,897	1,969,897
	Storm Drain Remediation	EnergySolutions	A	82,693	82,693
Greater than Class C (geologic repository)	Modified DSCs	Spent Fuel Equivalent	GTCC	1,502 <sup>[3]</sup>	5,772
Total Disposal Volume				2,289,673	2,387,638
Processed/Conditioned (at off-site recycling center)		Recycling Vendors	A	326,396	332,863

Notes:

1. Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55
2. Disposal cost discounted based upon industry experience for the large soil volume and low contamination level
3. Includes legacy (highly activated) waste from spent fuel pool in addition to the highly-activated reactor vessel components

**TABLE 7**  
**WAGES and PERSON-HOUR COMPARISON**

<b>Labor Costs</b>				
	<b>Labor Category</b>	<b>2010 (\$/hour)</b>	<b>2015 (\$/hour)</b>	<b>Change (%)</b>
	Laborers	31.23	33.37	6.4
	Craft	49.78	51.44	3.2
	Foreman	54.02	55.73	3.1
<b>Person-Hours</b>		<b>2010 (hours)</b>	<b>2015 (hours)</b>	<b>Change (%)</b>
	Laborer/Craft	2,123,154	2,350,231	9.7

## **CONCLUSION**

The total cost to decommission the St. Lucie nuclear units increased 22.2% over the five year period between estimates or approximately 4.1% annually. The value is not indicative of the majority of the cost drivers, but skewed with the large increase in security and spent fuel management costs.

As shown in Table 1, license termination costs (or the cost associated with “decommissioning” as defined by the NRC in its financial assurance regulations) increased 14.8% over the five year period (for an average annual increase of 2.8%). As discussed in the previous narrative, the change is the result of the increase in the security organization, energy costs, the increase in the decommissioning waste stream (from a change in the waste packaging density and additional concrete), as well as general increases in labor and material costs.

The spent fuel management category contains costs associated with the interim storage of fuel at the St. Lucie site until such time that the DOE is able to take possession. The costs estimated for this activity increased 47.0% from 2010. The contributors are significant increases in campaign costs for transfer of spent fuel from the pool to the DOE and ISFSI.

Site restoration (used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination) showed an increase of 16.9% over the five years. Higher costs for energy and security, as well as additional equipment costs contributed to the overall increase.

FLORIDA POWER & LIGHT COMPANY

2015 DECOMMISSIONING STUDY

TURKEY POINT NUCLEAR UNIT

NOS. 3 & 4

**December 2015**

**Florida Power & Light Company  
2015 Decommissioning Study  
Turkey Point Nuclear Units**

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SECTION 1

EXECUTIVE SUMMARY

## Overview

FPL's 2015 Nuclear Decommissioning Study results are based on estimates and assumptions that follow Nuclear Regulatory Commission ("NRC") requirements and industry guidelines for the development of the costs to remove and dismantle nuclear power plants years into the future. Funds are maintained and interest is reinvested in the decommissioning trusts as required by the NRC, Internal Revenue Service, Federal Energy Regulatory Commission ("FERC") and Florida Public Service Commission ("FPSC" or the "Commission"). Under federal law, these funds may only be used for nuclear decommissioning, are not available for any other use and do not earn a return or profit for FPL. The study is essentially a snapshot, which shows that based on current assumptions FPL's nuclear decommissioning trust funds are appropriately funded, i.e., the current fund balances exceed the expected costs of decommissioning on a present value basis. Compared to 2010, the currently calculated funding position has narrowed primarily because the increase in decommissioning costs outpaced the realized earnings from the trust fund investments over the last five years. The 2015 study and the 2010 study have been prepared excluding unrealized gains and losses. If one includes these unrealized gains, the funding position actually increased modestly between 2010 and 2015, reflecting an average annual earnings rate for the trust funds of about 5.1 percent over the five year period. FPL customers have not contributed to the decommissioning trusts since 2005, and the study confirms that, as of December 31, 2015, the trusts continue to be adequately funded without FPL customer contributions.

Decommissioning studies represent the aggregation of numerous estimates for activities and costs that will not be incurred for at least 17 years. As such, they are highly dependent upon input assumptions that can and will change over time, such that future funding positions could differ from today's position. Since the 2010 study, estimated decommissioning costs have increased more than the rate of inflation, primarily driven by actual data ascertained from recent, ongoing decommissioning experience in the industry. The largest increases of costs were in security, program management and spent fuel management. FPL has no evidence to suggest that the rate of increase experienced over these last five years would continue prospectively, but instead believes that these increases are due to the heightened level of current decommissioning activity which has significantly expanded our knowledge base regarding actual costs for certain specific activities compared to what was known in 2010. The current assumed long-term fund earnings rate of 3.7 percent is 0.2 percent lower than the assumption utilized in the 2010 study due to softened post-recession long-term return expectations in light of uncertainty in the sustainability of long-term global economic growth and lower base of interest rates. The increase in projected decommissioning costs and the decrease in the long-term fund earnings rate reaffirm the importance of maintaining adequate funding and the value of the periodic review of these studies as required by FPSC rule.

## 2015 Study Approach

The information contained in this 2015 Decommissioning Study is presented in compliance with Rule 25-6.04365, Florida Administrative Code, and prior Commission Orders. FPL contracted TLG Services, Inc. ("TLG"), the leading provider of these services to the U.S. nuclear industry, to prepare its 2015 site-specific nuclear decommissioning cost analysis and comparison reports, which are estimated based on NRC requirements, industry guidelines, and prior experience. TLG includes the most up-

to-date actual decommissioning information available to ensure the methodology used to prepare the cost analysis is reasonable.

FPL selected the DECON (immediate dismantlement) decommissioning option for its units. The DECON method provides not only a lower cost, but also enables a coordinated sequence of decommissioning events, which allows for a one-time mobilization of contractor personnel and equipment. FPL's choice of the DECON method is consistent with the method in prior studies approved by the Commission for purposes of determining FPL's appropriate accrual and funding requirements.

### Escalation Rate

The 2015 Decommissioning Study assumes that future decommissioning costs grow at an average rate of approximately 3.2 percent per year. This is only a small increase over the average escalation rate of 3.0 percent assumed in the 2010 study. FPL notes that the current escalation rates are within the typical post-recession range given that the current macro-economic market has improved since the last study.

### Spent Fuel Management

Consistent with prior studies and assumptions approved by the Commission, the decommissioning cost estimates include the cost associated with interim storage of spent nuclear fuel ("SNF") on site until such time the Department of Energy ("DOE") is able to remove SNF from the site. Consistent with the 2010 study, FPL reflects the reimbursements from the U.S. Government to cover the cost incurred for managing and storing SNF that would not have been incurred but for DOE's delay in SNF disposal. As such and for purposes of this study, the DOE is expected to make payments to FPL to cover spent fuel management costs incurred by FPL prior to 2063 for St. Lucie and 2059 for Turkey Point. The ultimate timing and amount of reimbursements will depend on many factors, including but not limited to, the DOE's ability to receive SNF and the Government's compliance with the terms of the Settlement Agreement.

### Conclusion

The 2015 Decommissioning Study indicates that the trusts are at an adequate funding level given current assumptions and projections. FPL has earned its customers' trust by using careful, prudent investment strategies in all facets of its business including the management of its nuclear decommissioning trusts. Despite market volatility, the funds remain secure. As a result, FPL's current annual expense accrual requirements for decommissioning costs presented in this study support a zero accrual and funding requirement as of December 31, 2015.

In addition, as required by the Commission in Order Nos. FPSC-02-0055-PAA-EI and FPSC-10-0153-FOF-EI, FPL has updated its estimates for End-of-Life Nuclear Fuel Last Core and End-of-Life Materials and Supplies Inventory balances for each of its nuclear sites. This information is provided for informational purposes with this study. FPL is not requesting a change in accruals at this time. Rather, FPL believes that the results of these updated values for should be addressed in FPL's next base rate proceeding and that the appropriate changes in accruals, if any, should be made at that time.

SECTION 2

ASSUMPTIONS

**Florida Power & Light Company  
2015 Decommissioning Study  
Turkey Point Nuclear Units  
Assumptions**

Assumptions Summary

Following is a summary of the assumptions used to derive the annual accrual, and funding and revenue requirements. These assumptions are more fully developed on the following pages.

	<u>Unit No. 3</u>	<u>Unit No. 4</u>
Decommissioning Method	DECON (Prompt Removal/ Dismantling)	DECON (Prompt Removal/ Dismantling)
Total Decommissioning Cost Per TLG Services, Inc. (current cost estimate in 2015 \$)	\$846,034,000	\$933,515,000
FPL's Cost of Decommissioning (Jurisdictional) In 2015 \$	\$800,610,000	\$883,394,000
Method of Funding (2015 – End)	Qualified/ Nonqualified	Qualified/ Nonqualified
Funding Periods (Years to License Expiration)	16.54	17.29
Assumed Fund Earnings rate	3.7%	3.7%
Average Escalation Rate for Decommissioning Costs (2015 – End)	3.23%	3.20%
FPL Ownership Allocation (%)	100%	100%
FPSC Jurisdictional Separation Factor (%)	94.6310%	94.6310%
Estimated Fund Balance - Qualified (12/31/15)	\$430,704,000	\$493,497,000

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	<u>Unit No. 3</u>	<u>Unit No. 4</u>
Estimated fund Balance - Nonqualified (12/31/15)	\$180,542,000	\$193,436,000
End of Life M & S Inventory Value (12/31/15)	N/A	\$36,434,727
End of Life Nuclear Fuel Last Core Values (12/31/15)	\$67,500,000	\$62,700,000
Year of Last Pick Up of Spent Fuel	2072	2072
Expected DOE Reimbursement (Current cost estimate in 2015 \$)	\$149,880,000	\$154,353,000

Decommissioning Methods

For purposes of this analysis, decommissioning is defined as the activity whereby nuclear facilities are removed safely from service and residual radioactivity is reduced to a level that permits release of the property for unrestricted use and termination of the operating license granted under Title 10 CFR Part 50. Decommissioning also includes the dismantlement, disposal and site restoration activities associated with the non-contaminated portion of the facilities. These activities are not required for termination of the operating license, but are required to address other non-radiological requirements associated with the release of the site.

The Nuclear Regulatory Commission (NRC) has defined three acceptable decommissioning methods: Prompt Removal/Dismantling (DECON); Safe Storage/Deferred Decontamination (SAFSTOR); and Entombment (ENTOMB). The study utilizes the NRC terminology, but also includes the additional activities required to accommodate the non-contaminated portion of the facilities.

The DECON and SAFSTOR alternatives were both examined and are presented in the (TLG) Decommissioning Cost Analysis (Section 10) of this filing. The ENTOMB alternative was not considered, because it is considered impractical for a facility which generates significant amounts of long-lived radioactive material due to neutron activation. FPL selected the DECON decommissioning option for Turkey Point Units 3 and 4. The DECON method provides not only a lower cost, but also enables a sequence of events, which allows for a one-time mobilization of contractor personnel and equipment. This

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method is consistent with the method in prior studies approved by the Commission for purposes of determining the appropriate accrual and funding requirements.

Total Decommissioning Costs

Below are the total estimated costs of decommissioning the Turkey Point facility as provided by FPL's consultant, TLG Services, Inc. in 2015 dollars.

Turkey Point Unit No. 3		
Labor	\$	464,827,000
Equip & Materials		148,222,000
Transportation		19,874,000
Burial		71,714,000
Other		<u>141,397,000</u>
Total		846,034,000

Turkey Point Unit No. 4		
Labor	\$	519,363,000
Equip & Materials		179,029,000
Transportation		20,714,000
Burial		79,402,000
Other		<u>135,007,000</u>
Total		933,515,000

Funding Method

In Docket No. 810100-EU, Order No. 10987 issued July 13, 1982, the FPSC ordered FPL to establish a funded reserve. Beginning in 1983 FPL began making contributions, on a net of tax basis, to an externally funded reserve. In 1986, the Treasury Department issued temporary regulations under Internal Revenue Code Section 468A relating to the deductibility of contributions made to a qualified decommissioning fund. These regulations, which were finalized in March of 1988, provide for an annual election by the taxpayer to make tax-deductible contributions to a qualified nuclear decommissioning fund. Qualified nuclear decommissioning funds have been established by FPL for each of the four nuclear units. FPL elected to make contributions to the qualified funds, to the maximum allowed, for the years 1984 through 1987, 1992 through 2004 and for the year to date period ended August 31, 2005. Per the Stipulation and Settlement Agreement approved by the Commission in FPSC Order No. FPSC-05-0902-S-EI, FPL suspended

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accruals effective September 1, 2005, and as such, no additional contributions to the funds have been made subsequent to that date.

The funding analysis presented in Section G of this study indicates that no additional contributions to the qualified and nonqualified funds are projected to be required through the remainder of the funding period that ends with the expiration of the unit's operating license. Only the after-tax earnings of the trust fund investments are assumed to continue to be reinvested and accumulated in the respective funds. Future decommissioning expenditures are assumed to be distributed from the qualified and nonqualified funds in proportion to the balance accumulated at the time of expenditure.

Funding Period

The funding period, to the extent funding is required, is that period over which revenues are collected from ratepayers for purposes of decommissioning the Turkey Point Units. Funding periods for both units end on the last day of the month preceding the month in which the operating license for the unit is due to expire. The operating license expiration dates for the Turkey Point units are as follows.

- Turkey Point Unit No. 3 - July 19, 2032
- Turkey Point Unit No. 4 - April 10, 2033

Based on the results of the funding analysis presented in Support Schedule G, no additional funding is required at this time.

Fund Earnings Rate

For purposes of this 2015 study update and funding analysis, the projected annual funds earnings rate, net of taxes and all other administrative costs charged to the trust funds, for Units 3 and 4 qualified and nonqualified fund investments, is assumed to be 3.7%. This assumption is based on a projected real long-term, after tax and net of fees, earnings rate of 1.3% plus an estimated long term average inflation rate of 2.4%. The long-term, after tax and net of fees earnings rate reflects the projection of continued adequacy of the funds and assumes a conservative investment strategy where the funds are moved to 100% fixed income prior to the first year of decommissioning and a more conservative all bonds & cash asset mix in the final years of decommissioning. FPL recognizes that over the long-term period there will likely be periods when the earned return may be greater or less than the assumed 3.7%. Consistent with prior Commission practice and Rule 25-

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6.04365 (FAC) the assumptions presented in this 2015 study will be reviewed and updated as appropriate “at least once every five years”.

The annual rates of change in CPI were taken from “The U. S. Economy, The 30 – Year Outlook, August 2015”, published by Global Insight.

Escalation Rate

The annual escalation rates used to estimate total future dismantlement costs from 2015 through the final year of decommissioning are as follows:

	<u>Average Annual Escalation Rate</u>
Turkey Point Unit No. 3	3.23%
Turkey Point Unit No. 4	3.20%

The above rates were derived by applying separate inflation indices to each of the major cost components of Labor, Materials and Equipment, Transportation, Burial, and Other.

<u>Cost Component</u>	<u>Inflation Index</u>
Labor	Compensation per Hour
Materials and Equip.	PPI - Intermediate Materials, Supplies, and Components
Transportation	GDP Deflator-Transportation
Burial	FPL Analysis & CPI
Other	GDP (Implicit)

For purposes of this 2015 study update, the inflation indices were obtained from “The U.S. Economy, The 30 – Year Outlook, August 2015”, published by Global Insight except for the burial index.

The burial cost estimates are assumed to escalate at an average annual rate of 3.2%. This is an increase of 0.2% from the rate assumed in the 2010 study. FPL has an

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agreement with Energy Solutions which provides for the long-term disposal of Class A waste generated during decommissioning. As such, burial costs for disposal of Class A waste is estimated based on the Energy Solutions agreement. Escalation of pricing under this agreement is tied to changes in the Consumer Price Index (CPI). In addition, the cost estimates for processed/conditioned (at off-site recycling center) disposal of Class A waste is assumed to be at a competitive rate comparable to the Energy Solutions pricing. Burial cost rates for Class B and Class C waste, not covered by the Energy Solutions Agreement, are less certain and based on rates equivalent to Barnwell published rates. The escalation rate applicable to Class B and C waste is assumed to be 6.3% which approximates the historical rate of change of the most recently published Barnwell rates. The resulting annual escalation rate of 3.2% is a weighted average rate for both St. Lucie and Turkey Point. The Turkey Point component is a weighted rate based on Class A waste (approx. 74% of total burial costs) at the estimated long-term CPI rate of 2.4% and Class B and C waste (approx. 26% of total burial costs) estimated at 6.3%.

For a more detail calculation of the overall weighted average escalation rate and annual rate of change for each component please refer to Support Schedule G ("Inflation and Funding Analysis").

FPSC Jurisdictional Factor

The factor applicable to both units is 94.6310%.

Fund Balances

Estimated/actual fund balances (qualified and nonqualified) at December 31, 2015<sup>(a)</sup> for each of the two Turkey Point Units are as Follows:

	<u>Qualified</u>	<u>Nonqualified</u>
Unit No. 3	\$430,704,000	\$180,542,000
Unit No. 4	\$493,497,000	\$193,436,000

(a) Excluding unrealized market gains/losses.

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See support Schedule C ("Projected Fund and Reserve Balances") for detail composition and adjustments to the qualified and nonqualified fund balances.

End of Life Materials and Supplies Inventory Values

The decommissioning cost estimates contained in the TLG Decommissioning Cost Analysis section of this study and in the funding analysis contained in Support Schedule G of this filing do not take into consideration the unrecovered value of any Materials and Supplies Inventories that will ultimately exist at the site following shut down of both units. Both FPL and this Commission have previously recognized that there will be a level of inventories that will remain at the end of life of Unit No. 4, the last unit to reach end of license, which must be recovered prior to the end of site operations. These inventories are unique and will have little value other than scrap value when the units are decommissioned. In Order No. FPSC-02-0055-PAA-EI, the Commission authorized FPL to begin recording the amortization of estimated end of life materials and supplies costs as a base rate fuel expense with a credit to a separate (unfunded) sub-account of Reserve Account 228. Additionally, the Commission directed the Company to address the costs associated with the materials and supplies in subsequent decommissioning studies so that the related annual accruals can be revised, if warranted. The annual expense/reserve accruals associated with End of Life Inventories are being accounted for, as directed by the Commission, in a separate (unfunded) sub-account of Reserve Account 228.

As provided in Support Schedule E of this study, the Materials and Supplies inventory balance, less estimated salvage, that is anticipated to remain at the end of life of Unit No. 4, the last unit to reach end of license, is projected to be \$36,434,727. The actual balance accrued as of December 31, 2015 is \$14,927,274. FPL is not requesting a change in accruals at this time. Rather, FPL believes that the results of these updated values for End of Life Materials and Supplies should be addressed in FPL's next base rate proceeding and the appropriate changes in accruals, if any, be made at that time.

End of Life Last Core Nuclear Fuel Values

FPL recognizes that there will be unburned fuel that will remain in the fuel assemblies at the end of the last operating cycle of each nuclear unit when it ceases operation. In Docket No 981246-EI the Commission found that the cost associated with the Last Core were costs that should be considered a base rate future obligation and that amortization of this obligation over the remaining life span of each nuclear unit ratably allocates the



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the inability of the DOE to provide for the timely removal of SNF. In Order Nos. PSC-95-1531-FOF-EI and PSC-02-0055-PAA-EI, the FPSC specifically approved the inclusion of costs associated with the dry storage of spent nuclear fuel following the end of each units operating license which were considered necessary to accommodate the timely decommissioning of each unit.

Consistent with the Commission's prior findings, this updated 2015 decommissioning study includes the costs relating to the construction, operation, and dismantlement of an on-site independent spent fuel storage installation (ISFSI) that is required to accommodate the timely decommissioning of the Turkey Point units. The potential cost impact of extended spent fuel storage that will exist subsequent to the license expiration of the Turkey Point nuclear units is presented in (Section 10) the 2015 Decommissioning Cost Analysis for the Turkey Point Plant. The decommissioning cost estimates included in this filing are based on the TLG prepared Decommissioning Cost Analysis for the Turkey Point Plant, Units 3 and 4 dated November, 2015.

In addition, FPL and certain nuclear plant joint owners signed a settlement agreement (spent fuel settlement agreement) with the U.S. Government in 2009 agreeing to dismiss with prejudice lawsuits filed against the U.S. Government seeking damages caused by the DOE's failure to dispose of spent nuclear fuel from FPL's nuclear plants. As such, the DOE is expected to continue to make payments to FPL to cover the costs incurred for managing and storing the spent fuel that it would not have incurred but for DOE's delay in performance.

Below are the Turkey Point estimated costs of Decommissioning expected to be recovered from the DOE as provided by FPL's consultant, TLG Services, Inc. in 2015 dollars.

Turkey Point Unit No. 3			
Labor	\$		63,652,000
Equip & Materials			63,023,000
Other			<u>23,205,000</u>
Total			149,880,000

Turkey Point Unit No. 4			
Labor	\$		64,963,000
Equip & Materials			66,956,000
Other			<u>22,434,000</u>
Total			154,353,000

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Further discussion of the costs and assumptions regarding DOE reimbursement is contained in Section 3.8 of the Decommissioning Cost Analysis for the Turkey Point Plant, Units 3 and 4 dated November, 2015.

Annual Decommissioning Accrual Requirements

FPL's current annual expense accrual requirements for Turkey Point Nuclear Plant Decommissioning costs presented in this study support a zero accrual and funding requirement as of December 31, 2015. The decommissioning costs estimates, funding analysis, and supporting assumptions presented in this study were prepared in a manner consistent with prior Commission approved studies, methodologies and practices.

SECTION 3

SUPPORT SCHEDULE A  
Nuclear Decommissioning Reserve Balance  
December 31, 2010 through November 30, 2015

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Reserve Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

<u>December 31, 2010</u>	<u>Beginning Balance</u>	<u>Revenues Collected</u>	<u>Earnings to Reserve</u>	<u>Ending Balance</u>
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$237,838	\$0	\$7,993	\$245,831
Turkey Point Unit No. 4	254,811	0	8,566	263,377
St. Lucie Unit No. 1	214,314	0	7,202	221,516
St. Lucie Unit No. 2	104,253	0	3,519	107,772
TOTAL	<u>\$811,216</u>	<u>\$0</u>	<u>\$27,280</u>	<u>\$838,496</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$326,529	\$0	\$12,830	\$339,359
Turkey Point Unit No. 4	374,182	0	14,695	388,877
St. Lucie Unit No. 1	423,056	0	16,614	439,670
St. Lucie Unit No. 2	387,013	0	15,179	402,192
TOTAL	<u>\$1,510,781</u>	<u>\$0</u>	<u>\$59,317</u>	<u>\$1,570,097</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$564,367	\$0	\$20,823	\$585,191
Turkey Point Unit No. 4	628,993	0	23,261	652,254
St. Lucie Unit No. 1	637,370	0	23,816	661,186
St. Lucie Unit No. 2	491,266	0	18,698	509,963
TOTAL	<u>\$2,321,996</u>	<u>\$0</u>	<u>\$86,597</u>	<u>\$2,408,593</u>
 <u>December 30, 2011</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$245,831	\$0	\$9,497	\$255,329
Turkey Point Unit No. 4	263,377	0	10,178	273,555
St. Lucie Unit No. 1	221,516	0	8,557	230,073
St. Lucie Unit No. 2	107,772	0	4,181	111,953
TOTAL	<u>\$838,496</u>	<u>\$0</u>	<u>\$32,414</u>	<u>\$870,910</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$339,359	\$0	\$9,987	\$349,346
Turkey Point Unit No. 4	388,877	0	11,437	400,314
St. Lucie Unit No. 1	439,670	0	12,928	452,598
St. Lucie Unit No. 2	402,192	0	11,813	414,005
TOTAL	<u>\$1,570,097</u>	<u>\$0</u>	<u>\$46,165</u>	<u>\$1,616,262</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$585,191	\$0	\$19,484	\$604,675
Turkey Point Unit No. 4	652,254	0	21,615	673,869
St. Lucie Unit No. 1	661,186	0	21,485	682,671
St. Lucie Unit No. 2	509,963	0	15,995	525,958
TOTAL	<u>\$2,408,593</u>	<u>\$0</u>	<u>\$78,579</u>	<u>\$2,487,173</u>

(1) Balances exclude unrealized market gains/losses.

Florida Power & Light Company  
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Support Schedule: Nuclear Decommissioning Reserve Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

<u>December 31, 2012</u>	<u>Beginning Balance</u>	<u>Revenues Collected</u>	<u>Earnings to Reserve</u>	<u>Ending Balance</u>
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$255,329	\$0	\$9,424	\$264,753
Turkey Point Unit No. 4	273,555	0	10,100	283,654
St. Lucie Unit No. 1	230,073	0	8,491	238,565
St. Lucie Unit No. 2	111,953	0	4,149	116,102
TOTAL	<u>\$870,910</u>	<u>\$0</u>	<u>\$32,164</u>	<u>\$903,075</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$349,346	\$0	\$17,029	\$366,375
Turkey Point Unit No. 4	400,314	0	19,503	419,817
St. Lucie Unit No. 1	452,598	0	22,050	474,648
St. Lucie Unit No. 2	414,005	0	20,147	434,152
TOTAL	<u>\$1,616,262</u>	<u>\$0</u>	<u>\$78,729</u>	<u>\$1,694,991</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$604,675	\$0	\$26,453	\$631,128
Turkey Point Unit No. 4	673,869	0	29,602	703,471
St. Lucie Unit No. 1	682,671	0	30,542	713,213
St. Lucie Unit No. 2	525,958	0	24,296	550,254
TOTAL	<u>\$2,487,173</u>	<u>\$0</u>	<u>\$110,893</u>	<u>\$2,598,066</u>
 <u>December 31, 2013</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$264,753	\$0	\$9,315	\$274,067
Turkey Point Unit No. 4	283,654	0	9,982	293,637
St. Lucie Unit No. 1	238,565	0	8,393	246,958
St. Lucie Unit No. 2	116,102	0	4,101	120,203
TOTAL	<u>\$903,075</u>	<u>\$0</u>	<u>\$31,791</u>	<u>\$934,865</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$366,375	\$0	\$31,896	\$398,271
Turkey Point Unit No. 4	419,817	0	36,516	456,333
St. Lucie Unit No. 1	474,648	0	41,270	515,918
St. Lucie Unit No. 2	434,152	0	37,728	471,880
TOTAL	<u>\$1,694,991</u>	<u>\$0</u>	<u>\$147,410</u>	<u>\$1,842,401</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$631,128	\$0	\$41,210	\$672,338
Turkey Point Unit No. 4	703,471	0	46,498	749,969
St. Lucie Unit No. 1	713,213	0	49,663	762,876
St. Lucie Unit No. 2	550,254	0	41,829	592,083
TOTAL	<u>\$2,598,066</u>	<u>\$0</u>	<u>\$179,200</u>	<u>\$2,777,266</u>

(1) Balances exclude unrealized market gains/losses.

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Support Schedule: Nuclear Decommissioning Reserve Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

<u>December 31, 2014</u>	<u>Beginning Balance</u>	<u>Revenues Collected</u>	<u>Earnings to Reserve</u>	<u>Ending Balance</u>
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$274,067	\$0	\$9,941	\$284,009
Turkey Point Unit No. 4	293,637	0	10,654	304,290
St. Lucie Unit No. 1	246,958	0	8,957	255,915
St. Lucie Unit No. 2	120,203	0	4,377	124,580
TOTAL	<u>\$934,865</u>	<u>\$0</u>	<u>\$33,929</u>	<u>\$968,795</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$398,271	\$0	\$15,096	\$413,367
Turkey Point Unit No. 4	456,333	0	17,302	473,635
St. Lucie Unit No. 1	515,918	0	19,575	535,493
St. Lucie Unit No. 2	471,880	0	17,857	489,737
TOTAL	<u>\$1,842,401</u>	<u>\$0</u>	<u>\$69,830</u>	<u>\$1,912,231</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$672,338	\$0	\$25,037	\$697,375
Turkey Point Unit No. 4	749,969	0	27,956	777,925
St. Lucie Unit No. 1	762,876	0	28,532	791,408
St. Lucie Unit No. 2	592,083	0	22,234	614,317
TOTAL	<u>\$2,777,266</u>	<u>\$0</u>	<u>\$103,760</u>	<u>\$2,881,026</u>
 <u>November 30, 2015</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$284,009	\$0	\$9,088	\$293,096
Turkey Point Unit No. 4	304,290	0	9,739	314,029
St. Lucie Unit No. 1	255,915	0	8,188	264,103
St. Lucie Unit No. 2	124,580	0	4,001	128,581
TOTAL	<u>\$968,795</u>	<u>\$0</u>	<u>\$31,016</u>	<u>\$999,810</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$413,367	\$0	\$15,892	\$429,259
Turkey Point Unit No. 4	473,635	0	18,207	491,842
St. Lucie Unit No. 1	535,493	0	20,585	556,078
St. Lucie Unit No. 2	489,737	0	18,805	508,542
TOTAL	<u>\$1,912,231</u>	<u>\$0</u>	<u>\$73,489</u>	<u>\$1,985,720</u>
<u>TOTAL RESERVES</u>				
Turkey Point Unit No. 3	\$697,375	\$0	\$24,980	\$722,355
Turkey Point Unit No. 4	777,925	0	27,946	805,871
St. Lucie Unit No. 1	791,408	0	28,773	820,181
St. Lucie Unit No. 2	614,317	0	22,806	637,123
TOTAL	<u>\$2,881,026</u>	<u>\$0</u>	<u>\$104,504</u>	<u>\$2,985,530</u>

(1) Balances exclude unrealized market gains/losses.

SECTION 4

SUPPORT SCHEDULE B  
Nuclear Decommissioning Fund Balance  
December 31, 2010 through November 30, 2015

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Fund Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

<u>December 31, 2010</u>	<u>Beginning Balance</u>	<u>Contribution</u>	<u>Fund Earnings</u>	<u>Ending Balance</u>
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$146,092	\$0	\$4,910	\$151,002
Turkey Point Unit No. 4	156,517	0	5,262	161,779
St Lucie Unit No. 1	131,642	0	4,424	136,066
St Lucie Unit No. 2	64,037	0	2,162	66,199
Total	<u>\$498,289</u>	<u>\$0</u>	<u>\$16,757</u>	<u>\$515,046</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$326,529	\$0	\$12,830	\$339,359
Turkey Point Unit No. 4	374,182	0	14,695	388,877
St Lucie Unit No. 1	423,056	0	16,614	439,670
St Lucie Unit No. 2	387,013	0	15,179	402,191
Total	<u>\$1,510,781</u>	<u>\$0</u>	<u>\$59,317</u>	<u>\$1,570,097</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$472,621	\$0	\$17,740	\$490,361
Turkey Point Unit No. 4	530,700	0	19,956	550,656
St Lucie Unit No. 1	554,699	0	21,038	575,736
St Lucie Unit No. 2	451,051	0	17,340	468,391
Total	<u><u>\$2,009,070</u></u>	<u><u>\$0</u></u>	<u><u>\$76,074</u></u>	<u><u>\$2,085,144</u></u>

December 31, 2011

<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$151,002	\$0	\$5,834	\$156,835
Turkey Point Unit No. 4	161,779	0	6,252	168,031
St Lucie Unit No. 1	136,066	0	5,256	141,322
St Lucie Unit No. 2	66,199	0	2,568	68,767
Total	<u>\$515,046</u>	<u>\$0</u>	<u>\$19,910</u>	<u>\$534,956</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$339,359	\$0	\$9,987	\$349,346
Turkey Point Unit No. 4	388,877	0	11,437	400,314
St Lucie Unit No. 1	439,670	0	12,928	452,598
St Lucie Unit No. 2	402,191	0	11,813	414,005
Total	<u>\$1,570,097</u>	<u>\$0</u>	<u>\$46,165</u>	<u>\$1,616,262</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$490,361	\$0	\$15,821	\$506,182
Turkey Point Unit No. 4	550,656	0	17,689	568,345
St Lucie Unit No. 1	575,736	0	18,184	593,920
St Lucie Unit No. 2	468,390	0	14,382	482,772
Total	<u><u>\$2,085,143</u></u>	<u><u>\$0</u></u>	<u><u>\$66,075</u></u>	<u><u>\$2,151,218</u></u>

(1) Balances exclude unrealized market gains/losses.

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Fund Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

	<u>Beginning Balance</u>	<u>Contribution</u>	<u>Fund Earnings</u>	<u>Ending Balance</u>
<u>December 31, 2012</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$156,835	\$0	\$5,789	\$162,624
Turkey Point Unit No. 4	168,031	0	6,204	174,234
St Lucie Unit No. 1	141,322	0	5,216	146,538
St Lucie Unit No. 2	68,767	0	2,549	71,316
Total	<u>\$534,956</u>	<u>\$0</u>	<u>\$19,757</u>	<u>\$554,713</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$349,346	\$0	\$17,029	\$366,375
Turkey Point Unit No. 4	400,314	0	19,503	419,817
St Lucie Unit No. 1	452,598	0	22,050	474,648
St Lucie Unit No. 2	414,005	0	20,147	434,151
Total	<u>\$1,616,262</u>	<u>\$0</u>	<u>\$78,729</u>	<u>\$1,694,991</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$506,182	\$0	\$22,818	\$528,999
Turkey Point Unit No. 4	568,345	0	25,706	594,051
St Lucie Unit No. 1	593,920	0	27,266	621,186
St Lucie Unit No. 2	482,772	0	22,696	505,468
Total	<u><u>\$2,151,218</u></u>	<u><u>\$0</u></u>	<u><u>\$98,486</u></u>	<u><u>\$2,249,704</u></u>
<u>December 31, 2013</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$162,624	\$0	\$5,722	\$168,346
Turkey Point Unit No. 4	174,234	0	6,132	180,366
St Lucie Unit No. 1	146,538	0	5,155	151,694
St Lucie Unit No. 2	71,316	0	2,519	73,835
Total	<u>\$554,713</u>	<u>\$0</u>	<u>\$19,527</u>	<u>\$574,240</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$366,375	\$0	\$31,896	\$398,271
Turkey Point Unit No. 4	419,817	0	36,516	456,333
St Lucie Unit No. 1	474,648	0	41,270	515,918
St Lucie Unit No. 2	434,151	0	37,728	471,879
Total	<u>\$1,694,991</u>	<u>\$0</u>	<u>\$147,410</u>	<u>\$1,842,401</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$528,999	\$0	\$37,617	\$566,617
Turkey Point Unit No. 4	594,051	0	42,648	636,699
St Lucie Unit No. 1	621,186	0	46,425	667,612
St Lucie Unit No. 2	505,468	0	40,247	545,714
Total	<u><u>\$2,249,704</u></u>	<u><u>\$0</u></u>	<u><u>\$166,937</u></u>	<u><u>\$2,416,641</u></u>

(1) Balances exclude unrealized market gains/losses.

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Nuclear Decommissioning Fund Balances (1)  
December 31, 2010 through November 30, 2015  
\$000

<u>December 31, 2014</u>	<u>Beginning Balance</u>	<u>Contribution</u>	<u>Fund Earnings</u>	<u>Ending Balance</u>
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$168,346	\$0	\$6,106	\$174,452
Turkey Point Unit No. 4	180,366	0	6,544	186,910
St Lucie Unit No. 1	151,694	0	5,502	157,196
St Lucie Unit No. 2	73,835	0	2,689	76,524
Total	<u>\$574,240</u>	<u>\$0</u>	<u>\$20,841</u>	<u>\$595,081</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$398,271	\$0	\$15,096	\$413,367
Turkey Point Unit No. 4	456,333	0	17,302	473,635
St Lucie Unit No. 1	515,918	0	19,575	535,493
St Lucie Unit No. 2	471,879	0	17,857	489,737
Total	<u>\$1,842,401</u>	<u>\$0</u>	<u>\$69,830</u>	<u>\$1,912,231</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$566,617	\$0	\$21,202	\$587,819
Turkey Point Unit No. 4	636,699	0	23,846	660,545
St Lucie Unit No. 1	667,612	0	25,077	692,689
St Lucie Unit No. 2	545,714	0	20,546	566,260
Total	<u><u>\$2,416,641</u></u>	<u><u>\$0</u></u>	<u><u>\$90,672</u></u>	<u><u>\$2,507,313</u></u>
 <u>November 30, 2015</u>				
<u>NONQUALIFIED</u>				
Turkey Point Unit No. 3	\$174,452	\$0	\$5,582	\$180,034
Turkey Point Unit No. 4	186,910	0	5,982	192,892
St Lucie Unit No. 1	157,196	0	5,030	162,225
St Lucie Unit No. 2	76,524	0	2,458	78,981
Total	<u>\$595,081</u>	<u>\$0</u>	<u>\$19,051</u>	<u>\$614,133</u>
<u>QUALIFIED</u>				
Turkey Point Unit No. 3	\$413,367	\$0	\$15,892	\$429,259
Turkey Point Unit No. 4	473,635	0	18,207	491,842
St Lucie Unit No. 1	535,493	0	20,585	556,078
St Lucie Unit No. 2	489,737	0	18,805	508,541
Total	<u>\$1,912,231</u>	<u>\$0</u>	<u>\$73,489</u>	<u>\$1,985,720</u>
<u>TOTAL</u>				
Turkey Point Unit No. 3	\$587,819	\$0	\$21,474	\$609,293
Turkey Point Unit No. 4	660,545	0	24,189	684,734
St Lucie Unit No. 1	692,689	0	25,614	718,303
St Lucie Unit No. 2	566,260	0	21,262	587,523
Total	<u><u>\$2,507,313</u></u>	<u><u>\$0</u></u>	<u><u>\$92,540</u></u>	<u><u>\$2,599,853</u></u>

(1) Balances exclude unrealized market gains/losses.

SECTION 5

SUPPORT SCHEDULE C  
Projected Fund and Reserve Balance  
At December 31, 2015

Florida Power & Light Company  
2015 Decommissioning Study  
Support Schedule: Projected Fund and Reserve Balance at December 31, 2015<sup>(a)</sup>  
\$000

	TURKEY POINT UNIT 3	TURKEY POINT UNIT 4	ST. LUCIE UNIT 1	ST. LUCIE UNIT 2 (Note 1)	TOTALS
<b>NON-QUALIFIED FUND</b>					
Actual Fund Balance @ 11/30/15	\$180,034	\$192,892	\$162,225	\$78,981	\$614,133
Add: Estimate Income Dec. 2015 (after-tax)	507	544	457	223	1,732
Est/Actual Fund Balance @ 12/31/15	\$180,542	\$193,436	\$162,682	\$79,205	\$615,865
<b>QUALIFIED FUND</b>					
Actual Fund Balance @ 11/30/15	\$429,259	\$491,842	\$556,078	\$508,541	\$1,985,720
Add: Estimate Income Dec. 2015 (after-tax)	1,445	1,655	1,871	1,710	6,681
Est/Actual Fund Balance @ 12/31/15	\$430,704	\$493,497	\$557,949	\$510,251	\$1,992,401
<b>TOTAL FUND</b>					
Actual Fund Balance @ 11/30/15	\$609,293	\$684,734	\$718,303	\$587,523	\$2,599,853
Add: Estimate Income Dec. 2015 (after-tax)	1,952	2,199	2,329	1,933	8,413
Est/Actual Fund Balance @ 12/31/15	\$611,246	\$686,933	\$720,631	\$589,456	\$2,608,266
<b>NON-QUALIFIED RESERVE</b>					
Actual Reserve Balance@ 11/30/15	\$293,096	\$314,029	\$264,103	\$128,581	\$999,810
Add: Estimate Income Dec. 2015	826	885	744	364	2,820
Est/Actual Reserve Balance@12/31/15	\$293,922	\$314,915	\$264,847	\$128,945	\$1,002,630
<b>QUALIFIED RESERVE</b>					
Actual Reserve Balance@ 11/30/15	\$429,259	\$491,842	\$556,078	\$508,542	\$1,985,720
Add: Estimate Income Dec. 2015	1,445	1,655	1,871	1,710	6,681
Est/Actual Reserve Balance@12/31/15	\$430,704	\$493,497	\$557,949	\$510,251	\$1,992,401
<b>TOTAL RESERVE</b>					
Actual Reserve Balance@ 11/30/15	\$722,355	\$805,871	\$820,181	\$637,123	\$2,985,530
Add: Estimate Income Dec. 2015	2,271	2,541	2,616	2,073	9,500
Est/Actual Reserve Balance@12/31/15	\$724,626	\$808,412	\$822,796	\$639,196	\$2,995,031

(a) Balances exclude unrealized market gains/losses.

Note (1): Amounts for St Lucie Common are included with Unit No. 2

SECTION 6

SUPPORT SCHEDULE D  
Reconciliation of Projected Fund and Reserve Balance  
At December 31, 2015

Florida Power & Light Company  
2015 Decommissioning Study

Support Schedule: Reconciliation of Projected Fund and Reserve Balance at December 31, 2015<sup>(a)</sup>  
\$000

**RECONCILIATION FUND/RESERVE**  
**Projected 12/31/2015**

	TURKEY POINT UNIT 3	TURKEY POINT UNIT 4	ST. LUCIE UNIT 1	ST. LUCIE UNIT 2 (Note 1)	TOTALS
<b>NON-QUALIFIED</b>					
Projected Fund Balance @12/31/15	\$180,542	\$193,436	\$162,682	\$79,205	\$615,865
Deferred Tax @ 12/31/15	113,381	121,479	102,165	49,740	386,765
Projected Reserve Balance @ 12/31/15	<u>\$293,922</u>	<u>\$314,915</u>	<u>\$264,847</u>	<u>\$128,945</u>	<u>\$1,002,630</u>
<b>QUALIFIED</b>					
Projected Fund Balance @12/31/15	\$430,704	\$493,497	\$557,949	\$510,251	\$1,992,401
Deferred Tax @ 12/31/15	0	0	0	0	0
Projected Reserve Balance @ 12/31/15	<u>\$430,704</u>	<u>\$493,497</u>	<u>\$557,949</u>	<u>\$510,251</u>	<u>\$1,992,401</u>
<b>TOTAL</b>					
Projected Fund Balance @12/31/15	\$611,246	\$686,933	\$720,631	\$589,456	\$2,608,266
Deferred Tax @ 12/31/15	113,381	121,479	102,165	49,740	386,765
Projected Reserve Balance @ 12/31/15	<u>\$724,626</u>	<u>\$808,412</u>	<u>\$822,796</u>	<u>\$639,196</u>	<u>\$2,995,031</u>

**DEFERRED TAXES**  
**Projected balance @ 12/31/15**

	TURKEY POINT UNIT 3	TURKEY POINT UNIT 4	ST. LUCIE UNIT 1	ST. LUCIE UNIT 2 (Note 1)	TOTALS
<b>NON-QUALIFIED FUND</b>					
Balance @ 11/30/15 (Fed & State)	\$113,062	\$121,137	\$101,878	\$49,600	\$385,677
Add: Tax on Earnings - December	319	342	287	140	1,088
Balance @ 12/31/15 (Fed & State)	<u>\$113,381</u>	<u>\$121,478</u>	<u>\$102,165</u>	<u>\$49,741</u>	<u>\$386,764</u>

(a) Balances exclude unrealized market gains/losses.

Note (1): Amounts for St Lucie Common are included with Unit No. 2

SECTION 7

SUPPORT SCHEDULE E  
End-of-Life Materials and Supplies Inventory  
Expense Accrual Calculation

**Florida Power and Light Company**  
**2015 Decommissioning Study**  
**Support Schedule: End-of-Life Materials and Supplies Inventory**

Support Schedule E  
Page 1 of 1

<u>Line Number</u>		<u>Turkey Point Unit 4</u>
1	Adjusted Ending Inventory Value @ End of License	\$ 36,786,556
2	Estimated Salvage	(351,829)
3	<b>Inventory Subject to Write-off</b>	<b><u>\$ 36,434,727</u></b>
4		
5	<b>FPL's Ownership Share 100%</b>	<b>\$ 36,434,727</b>
6		
7	Actual Reserve Balance Accrued as of 12/31/15	<u>14,927,274</u>
8		
9	<b>Remaining Amount to be Recovered as of 12/31/15</b>	<b><u>\$ 21,507,453</u></b>
10		
11		
12	Total Number of Months From:	
13	12/31/15 to End of License 4/10/2033	207.5
14		

SECTION 8

SUPPORT SCHEDULE F  
End-of-Life Unamortized Nuclear Fuel  
Expense Accrual Calculation

**Florida Power and Light Company**  
**2015 Decommissioning Study**  
**Support Schedule: End-of-Life Unamortized Nuclear Fuel**

<u>Line</u> <u>Number</u>		<b>Turkey Point <u>Unit 3</u></b>	<b>Turkey Point <u>Unit 4</u></b>
1	<b>Estimated Cost of Unburned Fuel @ End of License</b>		
2	<b>FPL's Ownership Share (100%)</b>	<b>\$ 67,500,000</b>	<b>\$ 62,700,000</b>
3			
4	Actual Reserve Balance at 12/31/2015	25,061,121	21,048,106
5			
6	<b>Remaining Amount to be Recovered at 12/31/2015</b>	<b>\$ 42,438,879</b>	<b>\$ 41,651,894</b>
7			
8			
9	Total Number of Months From:		
10	<b>12/31/15 to End of License</b>	198.5	207.5
11			

**SECTION 9**

**SUPPORT SCHEDULE G  
Inflation of Funding Analysis**

**INFLATION FORECAST**

The U.S. Economy  
 30 Year Outlook (Aug 2015)  
 GLOBAL INSIGHT

YEAR	GDP	HRLY COMP	PPI INT M&S	GDP Transport	Burial	CPI	CPI MULTIPLIER
2015	1.1%	2.7%	-7.3%	3.7%	3.2%	-0.2%	1.000
2016	2.0%	3.5%	0.9%	5.8%	3.2%	2.0%	1.020
2017	2.0%	3.7%	2.6%	5.5%	3.2%	2.5%	1.046
2018	1.9%	3.9%	2.4%	4.3%	3.2%	2.6%	1.073
2019	2.0%	3.9%	2.0%	3.5%	3.2%	2.5%	1.100
2020	1.9%	3.9%	0.5%	3.2%	3.2%	2.7%	1.129
2021	2.0%	3.9%	1.1%	3.1%	3.2%	2.3%	1.155
2022	2.1%	3.9%	1.9%	2.9%	3.2%	2.6%	1.185
2023	2.2%	3.9%	2.0%	2.6%	3.2%	2.6%	1.216
2024	2.1%	4.0%	1.4%	2.5%	3.2%	2.5%	1.247
2025	2.1%	4.0%	0.9%	2.6%	3.2%	2.4%	1.277
2026	2.1%	3.9%	0.8%	2.8%	3.2%	2.3%	1.307
2027	2.1%	3.9%	1.0%	3.2%	3.2%	2.3%	1.338
2028	2.1%	3.9%	1.2%	3.4%	3.2%	2.3%	1.369
2029	2.1%	3.8%	1.1%	3.7%	3.2%	2.3%	1.400
2030	2.1%	3.8%	1.0%	3.8%	3.2%	2.3%	1.432
2031	2.2%	3.9%	1.2%	4.0%	3.2%	2.3%	1.466
2032	2.2%	3.9%	0.9%	4.2%	3.2%	2.3%	1.500
2033	2.2%	3.9%	1.0%	4.4%	3.2%	2.3%	1.535
2034	2.2%	3.9%	1.1%	4.5%	3.2%	2.4%	1.571
2035	2.2%	3.9%	1.0%	4.5%	3.2%	2.4%	1.608
2036	2.2%	3.9%	1.0%	4.7%	3.2%	2.3%	1.646
2037	2.2%	3.9%	1.1%	4.7%	3.2%	2.4%	1.685
2038	2.2%	3.9%	1.1%	4.7%	3.2%	2.4%	1.725
2039	2.3%	3.9%	1.2%	4.8%	3.2%	2.5%	1.768
2040	2.3%	3.9%	1.2%	4.8%	3.2%	2.4%	1.811
2041	2.3%	3.9%	1.2%	4.8%	3.2%	2.4%	1.855
2042	2.3%	3.9%	1.2%	4.8%	3.2%	2.5%	1.901
2043	2.3%	3.9%	1.2%	4.8%	3.2%	2.5%	1.948
2044	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	1.996
2045	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.046
2046	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.097
2047	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.149
2048	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.203
2049	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.258
2050	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.314
2051	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.371
2052	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.430
2053	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.491
2054	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.553
2055	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.616
2056	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.682
2057	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.748
2058	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.817
2059	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.887
2060	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	2.959
2061	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.032
2062	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.108
2063	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.185
2064	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.265
2065	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.346
2066	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.429
2067	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.514
2068	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.602
2069	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.692
2070	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.784
2071	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.878
2072	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	3.974
2073	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.073
2074	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.175
2075	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.279
2076	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.385
2077	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.494
2078	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.606
2079	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.721
2080	2.4%	3.9%	1.2%	4.8%	3.2%	2.5%	4.838

2.45% = AVERAGE COMPOUND CPI INFLATION MULTILPLIER 2016-2074

**Florida Power & Light Company**  
**2015 Decommissioning Study**  
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**GENERAL ASSUMPTIONS**

JURISDICTIONAL FACTOR =		94.6310%			
FPL'S SHARE OF ST. LUCIE 2 COST (NET OF PARTICIPANTS)		85.14933%			
CORPORATE TAX RATE		38.575%			
			ANNUAL	MONTHLY	
EARNINGS RATE QUALIFIED FUND			3.700%	0.303225%	
EARNINGS RATE NON-QUALIFIED FUND			3.700%	0.303225%	
	TP3	TP4	SL1	SL2	
Adjusted QUALIFIED FUNDING % (at 12/31/15)	59.438%	61.045%	67.811%	79.827%	
<b>FUND BALANCES (\$000's)</b>					
A. QUALIFIED FUND BALANCE 11/30/15	429,259	491,842	556,078	508,541	
B. CONTRIBUTIONS - Dec 2015	-	-	-	-	
C. EARNINGS - Dec 2015	1,445	1,655	1,871	1,710	
D. QUALIFIED FUND BALANCE 12/31/15	430,704	493,497	557,949	510,251	
E. JURISDICTIONAL FACTOR	94.6310%	94.6310%	94.6310%	94.6310%	
F. JURIS. QUAL. FUND BAL. 12/31/15	407,579	467,001	527,993	482,855	
A. NON-QUALIFIED FUND BALANCE 11/30/15	180,034	192,892	162,225	78,981	
B. CONTRIBUTIONS - Dec 2015	-	-	-	-	
C. EARNINGS - Dec 2015	507	544	457	223	
D. NON-QUALIFIED FUND BALANCE 12/31/15	180,542	193,436	162,682	79,205	
E. JURISDICTIONAL FACTOR	94.6310%	94.6310%	94.6310%	94.6310%	
F. JURIS. NON-QUAL. FUND BAL. 12/31/15	170,848	183,050	153,948	74,952	
	Juris. Est/Actual Fund Balance	578,428	650,052	681,941	557,807
	Juris. Est/Actual Reserve Balance	685,721	765,008	778,621	604,877
	Adjusted/Actual Qualified split	0.5944	0.6105	0.6781	0.7983

Florida Power & Light Company  
 2015 Decommissioning Study  
 Turkey Point Nuclear Units  
 Support Schedule : Inflation and Funding Analysis

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Turkey Point Nuclear Plant, Unit 3 DECON - Total Decommissioning Cost (thousands, 2015 dollars)							Turkey Point Nuclear Plant, Unit 3 DECON - Total Decommissioning Cost (thousands, Future dollars)							Average Inflation Rate
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals	Year	Labor	Equipment & Materials	Transport	Burial	Other	Yearly Totals	
2032	28,412	2,135	1,527	20	3,882	35,975	2032	54,027	2,681	2,780	34	5,496	65,018	3.50%
2033	73,622	14,646	4,886	9,666	20,217	123,037	2033	145,422	18,580	9,288	17,040	29,263	219,592	3.30%
2034	68,433	27,016	3,374	27,889	18,114	144,826	2034	140,422	34,653	6,703	50,739	26,806	259,324	3.10%
2035	56,613	24,006	2,874	17,835	13,732	115,060	2035	120,670	31,104	5,969	33,487	20,770	212,000	3.10%
2036	44,616	20,657	2,526	6,159	9,834	83,791	2036	98,783	27,039	5,490	11,934	15,203	158,449	3.10%
2037	44,494	20,601	2,519	6,142	9,807	83,562	2037	102,336	27,258	5,733	12,282	15,499	163,109	3.10%
2038	18,133	4,396	843	3,071	6,008	32,452	2038	43,330	5,882	2,009	6,337	9,709	67,269	3.20%
2039	15,851	1,603	410	20	4,191	22,076	2039	39,349	2,171	1,025	43	6,926	49,514	3.40%
2040	15,457	6,423	386	4	1,617	23,887	2040	39,862	8,798	1,010	9	2,734	52,413	3.20%
2041	14,070	7,122	336	-	1,152	22,680	2041	37,701	9,870	922	-	1,992	50,484	3.10%
2042	3,261	884	17	-	1,151	5,313	2042	9,080	1,239	48	-	2,037	12,403	3.20%
2043	2,701	560	-	-	1,151	4,412	2043	7,812	794	-	-	2,084	10,691	3.20%
2044	2,708	561	-	-	1,154	4,424	2044	8,139	806	-	-	2,139	11,085	3.20%
2045	2,701	560	-	-	1,151	4,412	2045	8,433	813	-	-	2,184	11,430	3.20%
2046	2,701	560	-	-	1,151	4,412	2046	8,762	823	-	-	2,235	11,820	3.20%
2047	2,701	560	-	-	1,151	4,412	2047	9,104	833	-	-	2,288	12,224	3.20%
2048	2,708	561	-	-	1,154	4,424	2048	9,484	845	-	-	2,348	12,678	3.20%
2049	2,701	560	-	-	1,151	4,412	2049	9,827	853	-	-	2,397	13,077	3.20%
2050	2,701	560	-	-	1,151	4,412	2050	10,210	863	-	-	2,453	13,526	3.30%
2051	2,701	560	-	-	1,151	4,412	2051	10,608	873	-	-	2,511	13,993	3.30%
2052	2,708	561	-	-	1,154	4,424	2052	11,052	886	-	-	2,578	14,515	3.30%
2053	2,701	560	-	-	1,151	4,412	2053	11,451	894	-	-	2,631	14,976	3.30%
2054	2,701	560	-	-	1,151	4,412	2054	11,898	904	-	-	2,693	15,495	3.30%
2055	2,701	560	-	-	1,151	4,412	2055	12,361	915	-	-	2,757	16,033	3.30%
2056	2,708	561	-	-	1,154	4,424	2056	12,878	929	-	-	2,829	16,636	3.30%
2057	2,701	560	-	-	1,151	4,412	2057	13,344	937	-	-	2,888	17,169	3.30%
2058	2,701	560	-	-	1,151	4,412	2058	13,864	948	-	-	2,956	17,768	3.30%
2059	2,701	560	-	-	1,151	4,412	2059	14,404	959	-	-	3,026	18,389	3.30%
2060	2,708	561	-	-	1,154	4,424	2060	15,007	973	-	-	3,106	19,086	3.30%
2061	2,701	560	-	-	1,151	4,412	2061	15,549	982	-	-	3,170	19,701	3.30%
2062	2,701	560	-	-	1,151	4,412	2062	16,155	994	-	-	3,245	20,394	3.30%
2063	2,701	560	-	-	1,151	4,412	2063	16,785	1,006	-	-	3,322	21,112	3.30%
2064	2,708	561	-	-	1,154	4,424	2064	17,487	1,020	-	-	3,409	21,916	3.30%
2065	2,701	560	-	-	1,151	4,412	2065	18,119	1,030	-	-	3,480	22,628	3.30%
2066	2,701	560	-	-	1,151	4,412	2066	18,825	1,042	-	-	3,562	23,429	3.30%
2067	2,701	560	-	-	1,151	4,412	2067	19,559	1,054	-	-	3,646	24,259	3.30%
2068	2,708	561	-	-	1,154	4,424	2068	20,377	1,070	-	-	3,742	25,188	3.30%
2069	2,701	560	-	-	1,151	4,412	2069	21,113	1,079	-	-	3,820	26,012	3.30%
2070	2,701	560	-	-	1,151	4,412	2070	21,936	1,092	-	-	3,910	26,938	3.30%
2071	2,701	560	-	-	1,151	4,412	2071	22,791	1,105	-	-	4,002	27,898	3.30%
2072	2,701	1,767	-	-	16,142	20,610	2072	23,681	3,529	-	-	57,445	84,655	2.50%
2073	788	717	177	907	2,145	4,734	2073	7,174	1,449	2,202	5,638	7,814	24,277	2.90%
<b>Total</b>	<b>464,827</b>	<b>148,222</b>	<b>19,874</b>	<b>71,714</b>	<b>141,397</b>	<b>846,034</b>	<b>Total</b>	<b>1,269,171</b>	<b>201,576</b>	<b>43,179</b>	<b>137,544</b>	<b>287,106</b>	<b>1,938,576</b>	<b>3.23%</b>

**NOTE:** The 2015 cash flows are inflated to the year of expenditure based on the indices provided on Support Schedule G, page 1 of 8

Florida Power & Light Company  
 2015 Decommissioning Study  
 Turkey Point Nuclear Units  
 Support Schedule : Inflation and Funding Analysis

Turkey Point Nuclear Plant, Unit 4 DECON - Total Decommissioning Cost (thousands, 2015 dollars)							Turkey Point Nuclear Plant, Unit 4 DECON - Total Decommissioning Cost (thousands, Future dollars)							Average Inflation Rate
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals	Year	Labor	Equipment & Materials	Transport	Burial	Other	Yearly Totals	
2033	39,827	2,120	2,448	32	5,709	50,135	2033	78,667	2,690	4,653	56	8,263	94,329	3.60%
2034	58,461	11,951	5,574	12,532	16,852	105,370	2034	119,959	15,329	11,074	22,800	24,938	194,100	3.30%
2035	71,208	21,823	3,191	26,959	16,684	139,864	2035	151,778	28,275	6,626	50,617	25,235	262,532	3.20%
2036	68,713	25,459	2,886	18,839	13,948	129,845	2036	152,134	33,325	6,274	36,504	21,565	249,802	3.20%
2037	65,432	29,501	2,519	9,368	10,712	117,531	2037	150,492	39,036	5,733	18,732	16,930	230,922	3.10%
2038	60,958	30,083	2,248	8,524	9,881	111,695	2038	145,662	40,251	5,360	17,591	15,967	224,831	3.10%
2039	33,230	14,419	933	2,236	5,281	56,099	2039	82,488	19,522	2,331	4,763	8,727	117,831	3.10%
2040	17,608	7,980	386	4	1,759	27,737	2040	45,409	10,930	1,010	9	2,973	60,332	3.20%
2041	16,283	8,763	336	-	1,353	26,735	2041	43,631	12,144	922	-	2,340	59,037	3.10%
2042	3,445	1,187	17	-	1,160	5,808	2042	9,590	1,664	48	-	2,053	13,355	3.10%
2043	2,779	794	-	-	1,150	4,723	2043	8,038	1,126	-	-	2,083	11,247	3.10%
2044	2,786	796	-	-	1,154	4,736	2044	8,374	1,143	-	-	2,138	11,655	3.20%
2045	2,779	794	-	-	1,150	4,723	2045	8,677	1,153	-	-	2,182	12,012	3.20%
2046	2,779	794	-	-	1,150	4,723	2046	9,015	1,167	-	-	2,234	12,415	3.20%
2047	2,779	794	-	-	1,150	4,723	2047	9,366	1,180	-	-	2,286	12,833	3.20%
2048	2,786	796	-	-	1,154	4,736	2048	9,758	1,198	-	-	2,347	13,303	3.20%
2049	2,779	794	-	-	1,150	4,723	2049	10,111	1,209	-	-	2,396	13,715	3.20%
2050	2,779	794	-	-	1,150	4,723	2050	10,505	1,223	-	-	2,452	14,180	3.20%
2051	2,779	794	-	-	1,150	4,723	2051	10,914	1,237	-	-	2,510	14,661	3.20%
2052	2,786	796	-	-	1,154	4,736	2052	11,371	1,256	-	-	2,576	15,202	3.20%
2053	2,779	794	-	-	1,150	4,723	2053	11,782	1,267	-	-	2,630	15,678	3.20%
2054	2,779	794	-	-	1,150	4,723	2054	12,241	1,282	-	-	2,692	16,214	3.20%
2055	2,779	794	-	-	1,150	4,723	2055	12,718	1,297	-	-	2,755	16,770	3.20%
2056	2,786	796	-	-	1,154	4,736	2056	13,250	1,316	-	-	2,828	17,394	3.20%
2057	2,779	794	-	-	1,150	4,723	2057	13,729	1,328	-	-	2,886	17,943	3.20%
2058	2,779	794	-	-	1,150	4,723	2058	14,264	1,344	-	-	2,954	18,562	3.20%
2059	2,779	794	-	-	1,150	4,723	2059	14,820	1,360	-	-	3,024	19,204	3.20%
2060	2,786	796	-	-	1,154	4,736	2060	15,440	1,380	-	-	3,104	19,923	3.20%
2061	2,779	794	-	-	1,150	4,723	2061	15,998	1,392	-	-	3,168	20,558	3.20%
2062	2,779	794	-	-	1,150	4,723	2062	16,621	1,409	-	-	3,243	21,273	3.30%
2063	2,779	794	-	-	1,150	4,723	2063	17,269	1,426	-	-	3,319	22,014	3.30%
2064	2,786	796	-	-	1,154	4,736	2064	17,991	1,446	-	-	3,407	22,845	3.30%
2065	2,779	794	-	-	1,150	4,723	2065	18,641	1,460	-	-	3,478	23,579	3.30%
2066	2,779	794	-	-	1,150	4,723	2066	19,368	1,477	-	-	3,560	24,405	3.30%
2067	2,779	794	-	-	1,150	4,723	2067	20,123	1,494	-	-	3,644	25,261	3.30%
2068	2,786	796	-	-	1,154	4,736	2068	20,964	1,516	-	-	3,740	26,221	3.30%
2069	2,779	794	-	-	1,150	4,723	2069	21,722	1,530	-	-	3,818	27,070	3.30%
2070	2,779	794	-	-	1,150	4,723	2070	22,569	1,548	-	-	3,908	28,024	3.30%
2071	2,779	794	-	-	1,150	4,723	2071	23,448	1,566	-	-	4,000	29,015	3.30%
2072	2,776	1,992	-	-	16,139	20,907	2072	24,340	3,979	-	-	57,432	85,751	2.50%
2073	788	717	177	907	2,145	4,734	2073	7,174	1,449	2,202	5,638	7,814	24,277	2.90%
<b>Total</b>	<b>519,363</b>	<b>179,029</b>	<b>20,714</b>	<b>79,402</b>	<b>135,007</b>	<b>933,515</b>	<b>Total</b>	<b>1,430,411</b>	<b>247,323</b>	<b>46,232</b>	<b>156,710</b>	<b>279,598</b>	<b>2,160,274</b>	<b>3.20%</b>

**NOTE:** The 2015 cash flows are inflated to the year of expenditure based on the indices provided on Support Schedule G, page 1 of 8

Florida Power & Light Company  
2015 Decommissioning Study  
Turkey Point Nuclear Units

Support Schedule : Inflation and Funding Analysis

Turkey Point Nuclear Plant, Unit 3 DECON Costs Recovered for Spent Fuel Management (thousands, 2015 dollars)							Turkey Point Nuclear Plant, Unit 3 DECON Costs Recovered for Spent Fuel Management (thousands, Future dollars)						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals	Year	Labor	Equipment & Materials	Transport	Burial	Other	Yearly Totals
2032	-	-	-	-	-	-	2032	-	-	-	-	-	-
2033	418	1,254	-	-	26	1,697	2033	826	1,591	-	-	37	2,453
2034	1,135	3,406	-	-	56	4,597	2034	2,330	4,369	-	-	83	6,781
2035	1,509	4,528	-	-	56	6,094	2035	3,217	5,867	-	-	85	9,170
2036	3,227	9,682	-	-	56	12,966	2036	7,146	12,674	-	-	87	19,907
2037	5,162	15,487	-	-	56	20,705	2037	11,873	20,491	-	-	89	32,454
2038	5,148	15,444	-	-	56	20,649	2038	12,301	20,664	-	-	91	33,057
2039	312	936	-	-	538	1,786	2039	774	1,267	-	-	890	2,931
2040	329	986	-	-	561	1,875	2040	848	1,350	-	-	948	3,146
2041	302	907	-	-	1,067	2,277	2041	811	1,258	-	-	1,846	3,914
2042	284	853	-	-	1,150	2,287	2042	791	1,196	-	-	2,034	4,021
2043	2,582	574	-	-	1,151	4,307	2043	7,468	815	-	-	2,084	10,367
2044	2,701	560	-	-	1,151	4,412	2044	8,117	804	-	-	2,133	11,054
2045	2,708	561	-	-	1,154	4,424	2045	8,457	816	-	-	2,190	11,462
2046	2,701	560	-	-	1,151	4,412	2046	8,762	823	-	-	2,235	11,820
2047	2,701	560	-	-	1,151	4,412	2047	9,104	833	-	-	2,288	12,224
2048	2,701	560	-	-	1,151	4,412	2048	9,459	843	-	-	2,342	12,643
2049	2,708	561	-	-	1,154	4,424	2049	9,854	855	-	-	2,404	13,113
2050	2,701	560	-	-	1,151	4,412	2050	10,210	863	-	-	2,453	13,526
2051	2,701	560	-	-	1,151	4,412	2051	10,608	873	-	-	2,511	13,993
2052	2,701	560	-	-	1,151	4,412	2052	11,022	883	-	-	2,571	14,476
2053	2,708	561	-	-	1,154	4,424	2053	11,483	896	-	-	2,638	15,017
2054	2,701	560	-	-	1,151	4,412	2054	11,898	904	-	-	2,693	15,495
2055	2,701	560	-	-	1,151	4,412	2055	12,361	915	-	-	2,757	16,033
2056	2,701	560	-	-	1,151	4,412	2056	12,843	926	-	-	2,822	16,591
2057	2,708	561	-	-	1,154	4,424	2057	13,380	940	-	-	2,896	17,216
2058	2,701	560	-	-	1,151	4,412	2058	13,864	948	-	-	2,956	17,768
2059	2,701	560	-	-	1,151	4,412	2059	14,404	959	-	-	3,026	18,389
<b>Total</b>	<b>63,652</b>	<b>63,023</b>	-	-	<b>23,205</b>	<b>149,880</b>	<b>Total</b>	<b>224,209</b>	<b>85,622</b>	-	-	<b>49,189</b>	<b>359,020</b>

**NOTE:** The 2015 cash flows are inflated to the year of expenditure based on the indices provided on Support Schedule G, page 1 of 8

**Florida Power & Light Company**  
**2015 Decommissioning Study**  
**Turkey Point Nuclear Units**  
**Support Schedule : Inflation and Funding Analysis**

Turkey Point Nuclear Plant, Unit 4 DECON Costs Recovered for Spent Fuel Management (thousands, 2015 dollars)							Turkey Point Nuclear Plant, Unit 4 DECON Costs Recovered for Spent Fuel Management (thousands, Future dollars)						
Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Yearly Totals	Year	Labor	Equipment & Materials	Transport	Burial	Other	Yearly Totals
2032	-	-	-	-	-	-	2032	-	-	-	-	-	-
2033	-	-	-	-	-	-	2033	-	-	-	-	-	-
2034	236	709	-	-	41	986	2034	485	909	-	-	61	1,455
2035	88	264	-	-	56	408	2035	187	342	-	-	85	615
2036	-	-	-	-	56	56	2036	-	-	-	-	87	87
2037	3,529	10,588	-	-	56	14,174	2037	8,118	14,010	-	-	89	22,217
2038	7,578	22,734	-	-	56	30,368	2038	18,108	30,418	-	-	91	48,616
2039	5,834	17,502	-	-	172	23,508	2039	14,482	23,696	-	-	285	38,463
2040	441	1,322	-	-	561	2,323	2040	1,137	1,811	-	-	948	3,895
2041	114	341	-	-	909	1,364	2041	305	473	-	-	1,572	2,349
2042	10	31	-	-	965	1,007	2042	29	44	-	-	1,707	1,781
2043	2,642	756	-	-	1,141	4,540	2043	7,643	1,073	-	-	2,067	10,782
2044	2,779	794	-	-	1,150	4,723	2044	8,351	1,139	-	-	2,132	11,623
2045	2,786	796	-	-	1,154	4,736	2045	8,701	1,156	-	-	2,188	12,045
2046	2,779	794	-	-	1,150	4,723	2046	9,015	1,167	-	-	2,234	12,415
2047	2,779	794	-	-	1,150	4,723	2047	9,366	1,180	-	-	2,286	12,833
2048	2,779	794	-	-	1,150	4,723	2048	9,731	1,194	-	-	2,340	13,266
2049	2,786	796	-	-	1,154	4,736	2049	10,138	1,212	-	-	2,402	13,752
2050	2,779	794	-	-	1,150	4,723	2050	10,505	1,223	-	-	2,452	14,180
2051	2,779	794	-	-	1,150	4,723	2051	10,914	1,237	-	-	2,510	14,661
2052	2,779	794	-	-	1,150	4,723	2052	11,340	1,252	-	-	2,569	15,161
2053	2,786	796	-	-	1,154	4,736	2053	11,814	1,270	-	-	2,637	15,721
2054	2,779	794	-	-	1,150	4,723	2054	12,241	1,282	-	-	2,692	16,214
2055	2,779	794	-	-	1,150	4,723	2055	12,718	1,297	-	-	2,755	16,770
2056	2,779	794	-	-	1,150	4,723	2056	13,214	1,313	-	-	2,820	17,346
2057	2,786	796	-	-	1,154	4,736	2057	13,766	1,332	-	-	2,894	17,992
2058	2,779	794	-	-	1,150	4,723	2058	14,264	1,344	-	-	2,954	18,562
2059	2,779	794	-	-	1,150	4,723	2059	14,820	1,360	-	-	3,024	19,204
<b>Total</b>	<b>64,963</b>	<b>66,956</b>	-	-	<b>22,434</b>	<b>154,353</b>	<b>Total</b>	<b>231,391</b>	<b>92,735</b>	-	-	<b>47,881</b>	<b>372,006</b>

**NOTE:** The 2015 cash flows are inflated to the year of expenditure based on the indices provided on Support Schedule G, page 1 of 8

Florida Power & Light Company  
 2015 Decommissioning Study  
 Turkey Point Nuclear Units  
 Support Schedule : Inflation and Funding Analysis

**TURKEY POINT UNIT 3**

EARNINGS RATE QUALIFIED FUND	NOMINAL ANNUAL	NOMINAL MONTHLY
EARNINGS RATE NON-QUALIFIED FUND	3.700%	0.303225%
CORPORATE TAX RATE	38.575%	
FPL'S SHARE OF COST (NET OF PARTICIPANTS)	100.000%	
JURISDICTIONAL FACTOR	94.6310%	
Adjusted QUALIFIED %	59.438%	
LICENSE ENDS MONTHS TO FUND	07/19/2032 198.5	

YEAR	SPENDING CURVE	ESTIMATED COST IN (\$2015)	ESTIMATED COST IN NOMINAL \$	ESTIMATED DOE RECOVERY NOMINAL \$	NET NOMINAL \$	JURISDICTIONAL AMOUNT	QUALIFIED AMOUNT	NON-QUAL AMOUNT	TAX SAVINGS	PV @ 3.7% QUALIFIED AMOUNT	PV @ 3.7% NON-QUAL AMOUNT
2032	4.2522%	\$ 35,975,061	\$ 65,018,246	\$ -	\$ 65,018,246	\$ 61,527,416	\$ 36,570,715	\$ 15,329,654	\$ 9,627,048	\$ 19,719,441	\$ 8,265,964
2033	14.5428%	123,036,867	219,592,479	2,453,290	217,139,189	205,480,986	122,133,953	51,195,915	32,151,118	63,506,591	26,620,591
2034	17.1182%	144,826,147	259,323,881	6,781,429	252,542,452	238,983,448	142,047,173	59,543,107	37,393,168	71,225,618	29,856,240
2035	13.5999%	115,059,997	211,999,987	9,169,889	202,830,098	191,940,150	114,085,540	47,822,194	30,032,416	55,163,965	23,123,543
2036	9.9040%	83,791,296	158,449,369	19,906,553	138,542,816	131,104,452	77,925,969	32,664,883	20,513,600	36,335,265	15,230,958
2037	9.8769%	83,562,358	163,108,605	32,453,595	130,655,009	123,640,142	73,489,327	30,805,138	19,345,677	33,043,925	13,851,300
2038	3.8357%	32,451,691	67,268,538	33,056,711	34,211,827	32,374,994	19,243,075	8,066,281	5,065,638	8,343,784	3,497,534
2039	2.6094%	22,076,139	49,514,329	2,930,718	46,583,611	44,082,537	26,201,814	10,983,234	6,897,489	10,955,727	4,592,404
2040	2.8234%	23,887,182	52,412,636	3,145,567	49,267,070	46,621,921	27,711,175	11,615,926	7,294,820	11,173,417	4,683,655
2041	2.6807%	22,679,562	50,484,242	3,913,712	46,570,529	44,070,158	26,194,456	10,980,150	6,895,552	10,185,016	4,269,339
2042	0.6280%	5,312,797	12,403,240	4,021,196	8,382,045	7,932,013	4,714,636	1,976,274	1,241,103	1,767,754	741,004
2043	0.5215%	4,411,928	10,691,022	10,366,662	324,360	306,945	182,442	76,476	48,027	65,966	27,652
2044	0.5229%	4,424,015	11,084,567	11,054,281	30,286	28,660	17,035	7,141	4,484	5,940	2,490
2045	0.5215%	4,411,928	11,430,489	11,461,805	(31,316)	(29,635)	(17,614)	(7,384)	(4,637)	(5,923)	(2,483)
2046	0.5215%	4,411,928	11,820,326	11,820,326	-	-	-	-	-	-	-
2047	0.5215%	4,411,928	12,224,304	12,224,304	-	-	-	-	-	-	-
2048	0.5229%	4,424,015	12,677,590	12,642,951	34,638	32,778	19,483	8,167	5,129	5,874	2,462
2049	0.5215%	4,411,928	13,076,818	13,112,645	(35,827)	(33,903)	(20,152)	(8,447)	(5,305)	(5,859)	(2,456)
2050	0.5215%	4,411,928	13,526,474	13,526,474	-	-	-	-	-	-	-
2051	0.5215%	4,411,928	13,992,512	13,992,512	-	-	-	-	-	-	-
2052	0.5229%	4,424,015	14,515,206	14,475,547	39,659	37,530	22,307	9,351	5,872	5,816	2,438
2053	0.5215%	4,411,928	14,976,216	15,017,246	(41,031)	(38,828)	(23,078)	(9,674)	(6,075)	(5,802)	(2,432)
2054	0.5215%	4,411,928	15,495,182	15,495,182	-	-	-	-	-	-	-
2055	0.5215%	4,411,928	16,033,133	16,033,133	-	-	-	-	-	-	-
2056	0.5229%	4,424,015	16,636,238	16,590,784	45,454	43,014	25,567	10,717	6,730	5,764	2,416
2057	0.5215%	4,411,928	17,168,875	17,215,913	(47,038)	(44,513)	(26,457)	(11,090)	(6,965)	(5,752)	(2,411)
2058	0.5215%	4,411,928	17,768,175	17,768,175	-	-	-	-	-	-	-
2059	0.5215%	4,411,928	18,389,485	18,389,485	-	-	-	-	-	-	-
2060	0.5229%	4,424,015	19,085,780	-	19,085,780	18,061,065	10,735,150	4,499,943	2,825,972	2,092,975	877,330
2061	0.5215%	4,411,928	19,701,482	-	19,701,482	18,643,709	11,081,463	4,645,110	2,917,137	2,083,408	873,320
2062	0.5215%	4,411,928	20,393,924	-	20,393,924	19,298,974	11,470,940	4,808,370	3,019,664	2,079,684	871,759
2063	0.5215%	4,411,928	21,111,888	-	21,111,888	19,978,391	11,874,772	4,977,648	3,125,971	2,076,084	870,250
2064	0.5229%	4,424,015	21,916,220	-	21,916,220	20,739,538	12,327,183	5,167,289	3,245,066	2,078,283	871,172
2065	0.5215%	4,411,928	22,628,277	-	22,628,277	21,413,365	12,727,693	5,335,174	3,350,498	2,069,245	867,383
2066	0.5215%	4,411,928	23,428,742	-	23,428,742	22,170,852	13,177,929	5,523,903	3,469,020	2,066,001	866,023
2067	0.5215%	4,411,928	24,258,811	-	24,258,811	22,956,355	13,644,817	5,719,613	3,591,926	2,062,872	864,712
2068	0.5229%	4,424,015	25,188,426	-	25,188,426	23,836,060	14,167,696	5,938,792	3,729,571	2,065,500	865,813
2069	0.5215%	4,411,928	26,012,289	-	26,012,289	24,615,689	14,631,093	6,133,038	3,851,558	2,056,951	862,229
2070	0.5215%	4,411,928	26,938,068	-	26,938,068	25,491,763	15,151,814	6,351,313	3,988,635	2,054,154	861,057
2071	0.5215%	4,411,928	27,898,197	-	27,898,197	26,400,343	15,691,857	6,577,687	4,130,798	2,051,464	859,930
2072	2.4361%	20,610,399	84,654,675	-	84,654,675	80,109,566	47,615,588	19,959,426	12,534,552	6,002,885	2,516,280
2073	0.5596%	4,734,428	24,277,386	-	24,277,386	22,973,933	13,655,265	5,723,992	3,594,676	1,660,092	695,875
<b>100.0000%</b>	<b>\$</b>	<b>846,034,442</b>	<b>\$ 1,938,576,328</b>	<b>\$ 359,020,087</b>	<b>\$ 1,579,556,241</b>	<b>\$ 1,494,749,866</b>	<b>\$ 888,450,623</b>	<b>\$ 372,419,310</b>	<b>\$ 233,879,933</b>	<b>\$ 353,986,126</b>	<b>\$ 148,383,338</b>

	QUALIFIED	NON-QUAL	TOTAL
NPV @12/31/15	\$ 353,986,126	\$ 148,383,338	\$ 502,369,464
LESS BALANCE @ 12/31/15	407,579,284	170,848,432	578,427,716
PV OF FUNDING REQUIREMENTS	\$ (53,593,157)	\$ (22,465,094)	\$ (76,058,251)

MONTHLY FUNDING REQUIREMENT	-	-	-
ANNUAL FUNDING REQUIREMENT	-	-	-
MONTHLY ACCRUAL	-	-	-
ANNUAL ACCRUAL	-	-	-

Florida Power & Light Company  
2015 Decommissioning Study  
Turkey Point Nuclear Units  
Support Schedule : Inflation and Funding Analysis

**TURKEY POINT UNIT 4**

	<b>NOMINAL ANNUAL</b>	<b>NOMINAL MONTHLY</b>
EARNINGS RATE QUALIFIED FUND	3.700%	0.303225%
EARNINGS RATE NON-QUALIFIED FUND	3.700%	0.303225%
CORPORATE TAX RATE	38.575%	
FPL'S SHARE OF COST (NET OF PARTICIPANTS)	100.000%	
JURISDICTIONAL FACTOR	94.6310%	
Adjusted QUALIFIED %	61.045%	

LICENSE ENDS 4/10/2033  
MONTHS TO FUND 207.5

YEAR	SPENDING CURVE	ESTIMATED COST IN (\$2015)	ESTIMATED COST IN NOMINAL \$	ESTIMATED DOE RECOVERY NOMINAL \$	NET NOMINAL \$	JURISDICTIONAL AMOUNT	QUALIFIED AMOUNT	NON-QUAL AMOUNT	TAX SAVINGS	PV @ 3.7% QUALIFIED AMOUNT	PV @ 3.7% NON-QUAL AMOUNT	
2033	5.3706%	\$ 50,135,340	\$ 94,329,374	-	\$ 94,329,374	\$ 89,264,830	\$ 54,491,992	\$ 21,359,216	\$ 13,413,622	\$ 28,334,468	\$ 11,106,256	
2034	11.2874%	105,369,695	194,100,400	1,455,126	192,645,274	182,302,149	111,286,911	43,621,110	27,394,128	55,801,737	21,872,597	
2035	14.9825%	139,863,625	262,531,843	614,542	261,917,301	247,854,961	151,303,828	59,306,534	37,244,600	73,160,184	28,676,584	
2036	13.9093%	129,845,434	249,801,935	87,033	249,714,903	236,307,709	144,254,773	56,543,517	35,509,420	67,263,011	26,365,070	
2037	12.5902%	117,531,252	230,922,207	22,217,197	208,705,010	197,499,638	120,564,265	47,257,553	29,677,820	54,210,818	21,249,004	
2038	11.9649%	111,694,513	224,830,977	48,616,416	176,214,561	166,753,601	101,795,252	39,900,666	25,057,683	44,138,353	17,300,902	
2039	6.0094%	56,098,547	117,831,019	38,462,669	79,368,350	75,107,063	45,849,339	17,971,557	11,286,167	19,170,919	7,514,422	
2040	2.9712%	27,736,783	60,331,700	3,894,876	56,436,824	53,406,731	32,602,304	12,779,119	8,025,308	13,145,569	5,152,666	
2041	2.8639%	26,734,978	59,036,579	2,349,277	56,687,301	53,643,760	32,746,999	12,835,835	8,060,925	12,732,798	4,990,872	
2042	0.6222%	5,808,427	13,354,688	1,780,706	11,573,981	10,952,574	6,686,033	2,620,723	1,645,818	2,506,929	982,641	
2043	0.5059%	4,722,900	11,246,708	10,781,941	464,767	439,814	268,486	105,238	66,090	97,077	38,051	
2044	0.5073%	4,735,840	11,654,576	11,622,733	31,843	30,133	18,395	7,210	4,528	6,414	2,514	
2045	0.5059%	4,722,900	12,012,017	12,044,926	(32,910)	(31,143)	(19,011)	(7,452)	(4,680)	(6,392)	(2,506)	
2046	0.5059%	4,722,900	12,415,333	-	-	-	-	-	-	-	-	
2047	0.5059%	4,722,900	12,833,206	12,833,206	-	-	-	-	-	-	-	
2048	0.5073%	4,735,840	13,302,527	13,266,181	36,346	34,394	20,996	8,230	5,168	6,331	2,481	
2049	0.5059%	4,722,900	13,714,822	13,752,396	(37,575)	(35,557)	(21,706)	(8,508)	(5,343)	(6,311)	(2,474)	
2050	0.5059%	4,722,900	14,179,715	14,179,715	-	-	-	-	-	-	-	
2051	0.5059%	4,722,900	14,661,471	14,661,471	-	-	-	-	-	-	-	
2052	0.5073%	4,735,840	15,202,256	15,160,720	41,536	39,306	23,995	9,405	5,906	6,256	2,452	
2053	0.5059%	4,722,900	15,678,119	15,721,073	(42,954)	(40,648)	(24,813)	(9,726)	(6,108)	(6,239)	(2,445)	
2054	0.5059%	4,722,900	16,214,349	16,214,349	-	-	-	-	-	-	-	
2055	0.5059%	4,722,900	16,770,118	16,770,118	-	-	-	-	-	-	-	
2056	0.5073%	4,735,840	17,393,684	17,346,160	47,524	44,972	27,453	10,761	6,758	6,190	2,426	
2057	0.5059%	4,722,900	17,943,237	17,992,396	(49,160)	(46,520)	(28,398)	(11,131)	(6,990)	(6,174)	(2,420)	
2058	0.5059%	4,722,900	18,562,140	18,562,140	-	-	-	-	-	-	-	
2059	0.5059%	4,722,900	19,203,691	19,203,691	-	-	-	-	-	-	-	
2060	0.5073%	4,735,840	19,923,177	-	19,923,177	18,853,502	11,509,179	4,511,251	2,833,073	2,243,883	879,535	
2061	0.5059%	4,722,900	20,558,181	-	20,558,181	19,454,412	11,876,006	4,655,036	2,923,370	2,232,789	875,186	
2062	0.5059%	4,722,900	21,272,925	-	21,272,925	20,130,782	12,288,898	4,816,877	3,025,007	2,227,981	873,301	
2063	0.5059%	4,722,900	22,013,930	-	22,013,930	20,832,002	12,716,960	4,984,664	3,130,377	2,223,325	871,476	
2064	0.5073%	4,735,840	22,844,603	-	22,844,603	21,618,076	13,196,821	5,172,756	3,248,499	2,224,899	872,093	
2065	0.5059%	4,722,900	23,578,723	-	23,578,723	22,312,781	13,620,906	5,338,984	3,352,891	2,214,462	868,002	
2066	0.5059%	4,722,900	24,404,609	-	24,404,609	23,094,326	14,098,002	5,525,991	3,470,332	2,210,248	866,351	
2067	0.5059%	4,722,900	25,260,954	-	25,260,954	23,904,693	14,592,694	5,719,896	3,592,104	2,206,176	864,754	
2068	0.5073%	4,735,840	26,220,549	-	26,220,549	24,812,768	15,147,031	5,937,179	3,728,558	2,208,276	865,578	
2069	0.5059%	4,722,900	27,069,670	-	27,069,670	25,616,299	15,637,549	6,129,447	3,849,303	2,198,446	861,725	
2070	0.5059%	4,722,900	28,024,479	-	28,024,479	26,519,845	16,189,122	6,345,647	3,985,077	2,194,783	860,289	
2071	0.5059%	4,722,900	29,014,627	-	29,014,627	27,456,831	16,761,108	6,569,848	4,125,875	2,191,252	858,905	
2072	2.2396%	20,907,408	85,751,001	-	85,751,001	81,147,029	49,536,455	19,416,795	12,193,779	6,245,048	2,447,870	
2073	0.5072%	4,734,428	24,277,386	-	24,277,386	22,973,933	14,024,508	5,497,184	3,452,240	1,704,982	668,301	
		<b>100.0000%</b>	<b>\$ 933,515,113</b>	<b>\$ 2,160,273,502</b>	<b>\$ 372,006,392</b>	<b>\$ 1,788,267,110</b>	<b>\$ 1,692,255,049</b>	<b>\$ 1,033,042,331</b>	<b>\$ 404,921,412</b>	<b>\$ 254,291,306</b>	<b>\$ 405,088,488</b>	<b>\$ 158,782,460</b>

	QUALIFIED	NON-QUAL	TOTAL
NPV @12/31/15	\$ 405,088,488	\$ 158,782,460	\$ 563,870,948
LESS BALANCE @ 12/31/15	467,001,314	183,050,419	650,051,732
PV OF FUNDING REQUIREMENTS	\$ (61,912,825)	\$ (24,267,959)	\$ (86,180,784)
MONTHLY FUNDING REQUIREMENT	-	-	-
ANNUAL FUNDING REQUIREMENT	-	-	-
MONTHLY ACCRUAL	-	-	-
ANNUAL ACCRUAL	-	-	-

SECTION 10

DECOMMISSIONING COST ANALYSIS  
FOR THE TURKEY POINT NUCLEAR PLANT UNITS 3 AND 4  
Prepared by  
TLG Services, Inc.

**DECOMMISSIONING COST ANALYSIS**

**for the**

**TURKEY POINT NUCLEAR PLANT,  
UNITS 3 AND 4**



*prepared for*

**Florida Power & Light Company**

*prepared by*

**TLG Services, Inc.  
Bridgewater, Connecticut**

**November 2015**

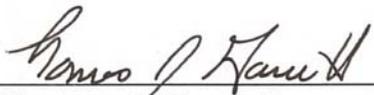
APPROVALS

Project Manager

  
\_\_\_\_\_  
William A. Cloutier, Jr.

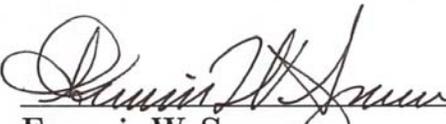
23 Nov 2015  
Date

Project Engineer

  
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Date

Technical Manager

  
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Francis W. Seymore

11/23/15  
Date

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**REVISION LOG**

<b>No.</b>	<b>Date</b>	<b>Item Revised</b>	<b>Reason for Revision</b>
0	11-23-2015		Original Issue

## **EXECUTIVE SUMMARY**

This report presents estimates of the cost to decommission the Turkey Point Nuclear Plant, Units 3 and 4 (Turkey Point) for the selected decommissioning scenarios following the scheduled cessation of plant operations. The estimates are designed to provide Florida Power & Light Company (FPL) with the information to assess its decommissioning liability, as it relates to Turkey Point.

The analysis relies upon site-specific, technical information from an evaluation prepared in 2010,<sup>[1]</sup> updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not an engineering evaluation, but estimates prepared in advance of the detailed planning required to carry out the decommissioning of the nuclear units. It may also not reflect the actual plan to decommission Turkey Point; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2010 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. No changes to the plant inventory over the past five years, that would impact decommissioning, were identified. Two new buildings, LLW storage building for B & C waste and maintenance professional facility, were added to structural inventory.

The costs to decommission Turkey Point for the scenarios evaluated are tabulated at the end of this section. Costs are reported in 2015 dollars and include monies anticipated to be spent for radiological remediation and operating license termination, spent fuel management, and site restoration activities.

A complete discussion of the assumptions relied upon in this analysis is provided in Section 3, along with schedules of annual expenditures for each scenario. A sequence of significant project activities is provided in Section 4 with a timeline for each scenario. Detailed cost reports used to generate the summary tables contained within this document are provided in Appendices C, D and E.

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<sup>1</sup> “Decommissioning Cost Analysis for the Turkey Point Nuclear Plant, Units 3 and 4,” Document F02-1630-002, Rev. 0, TLG Services, Inc., December 2010

Consistent with the 2010 analysis, the current cost estimates assume that the shutdown of the nuclear units is a scheduled and pre-planned event (e.g., there is no delay in transitioning the plant and workforce from operations or in obtaining regulatory relief from operating requirements).

The analysis recognizes that spent fuel will be stored at the site in the wet storage pools and/or in an independent spent fuel storage installation (ISFSI) until such time that it can be transferred to the U.S. Department of Energy (DOE). Consequently, the estimates also include those costs to manage and subsequently decommission these interim storage facilities.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the operating licenses for the nuclear units can be terminated. The estimates also include the dismantling of site structures and non-essential facilities and the limited restoration of the site.

### Alternatives and Regulations

The Nuclear Regulatory Commission (NRC) provided general decommissioning requirements in a rule adopted on June 27, 1988.<sup>[2]</sup> In this rule, the NRC set forth technical and financial criteria for decommissioning licensed nuclear facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

DECON is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."<sup>[3]</sup>

SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use."<sup>[4]</sup> Decommissioning is required to be completed within 60 years, although

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<sup>2</sup> U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72 "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

<sup>3</sup> Ibid. Page FR24022, Column 3

<sup>4</sup> Ibid.

longer time periods will be considered when necessary to protect public health and safety.

ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactive material decays to a level permitting unrestricted release of the property."<sup>[5]</sup> As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years, although longer time periods will also be considered when necessary to protect public health and safety..

The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations; however, rulemaking has been deferred pending completion of additional research studies (e.g., on engineering barriers).

In 1996, the NRC published revisions to its general requirements for decommissioning nuclear power plants to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process.<sup>[6]</sup> The amendments allow for greater public participation and better define the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000 (as revised in October 2013), further described the methods and procedures that are acceptable to the NRC staff for implementing the requirements of the 1996 revised rule that related to the initial activities and the major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and sequence in the amended regulations. The format and content of the estimates is also consistent with the recommendations of Regulatory Guide 1.202, issued in February 2005.<sup>[7]</sup>

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<sup>5</sup> Ibid. Page FR24023, Column 2

<sup>6</sup> U.S. Code of Federal Regulations, Title 10, Parts 2, 50, and 51, "Decommissioning of Nuclear Power Reactors," Nuclear Regulatory Commission, Federal Register Volume 61, (p 39278 et seq.), July 29, 1996

<sup>7</sup> "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, Nuclear Regulatory Commission, February 2005

## Decommissioning Scenarios

Two decommissioning scenarios were evaluated for Turkey Point. The scenarios selected are representative of alternatives currently available to the owner and are defined as follows:

1. DECON: The operating licenses for Units 3 and 4 currently expire in July 2032 and April 2033, respectively. The first scenario assumes that decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI so as to facilitate decontamination and dismantling activities within the fuel handling buildings. Spent fuel storage operations continue at the site until the transfer of the fuel to the DOE is complete, assumed to be in the year 2072.
2. SAFSTOR: The units are placed into safe-storage shortly after the permanent cessation of operations and defueling. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI to minimize caretaking costs. Decommissioning is deferred beyond the fuel storage period to the maximum extent possible; termination of the licenses would conclude within the required 60-year period. As with the DECON scenario, decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes.

## Methodology

The methodology used to develop the estimates follows the basic approach originally presented in the cost estimating guidelines<sup>[8]</sup> developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit cost factor method for estimating decommissioning activity costs. The unit cost factors used in this analysis incorporate site-specific costs and the latest available information about worker productivity in decommissioning.

An activity duration critical path is used to determine the total decommissioning program schedule. This is required for calculating the carrying costs, which include program management, administration, field engineering, equipment rental, quality assurance and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

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<sup>8</sup> T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

The estimates reflect lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, San Onofre and Vermont Yankee nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

### Contingency

Consistent with cost estimating practice, contingencies are applied to the decontamination and dismantling costs developed as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."<sup>[9]</sup> The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the nuclear units.

Contingency funds are expected to be fully expended throughout the program. As such, inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

### Low-Level Radioactive Waste Management

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is generally classified as low-level radioactive waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Disposal Act" in 1980,<sup>[10]</sup> and its Amendments of 1985,<sup>[11]</sup> the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

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<sup>9</sup> Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239

<sup>10</sup> "Low-Level Radioactive Waste Policy Act of 1980," Public Law 96-573, 1980

<sup>11</sup> "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, 1986

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to FPL. The majority of the low-level radioactive waste designated for direct disposal (Class A<sup>[12]</sup>) can be sent to EnergySolutions' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon FPL's Life of Plant Agreement with EnergySolutions. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste was assumed to be shipped to the WCS facility and disposal costs for the waste were based upon published rates for non-Compact generators.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis only, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in the same canisters used for spent fuel and either stored on site or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the metallic waste generated during decommissioning may potentially be contaminated by radioactive materials. Rather than designating this large volume for controlled disposal, this analysis assumes that the material is sent to a licensed facility for characterization and processing. Processing is routinely used to

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<sup>12</sup> Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55

reduce the volume, for example, by component disassembly, sorting, compaction and metal melt. The estimates reflect the savings from waste recovery/volume reduction.

### High-Level Radioactive Waste Management

Congress passed the “Nuclear Waste Policy Act” (NWPA) in 1982, assigning the federal government’s long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. It was to begin accepting spent fuel by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, even with the License Application for a geologic repository submitted by the DOE to the NRC in 2008. The current administration has cut the budget for the repository program while promising to “conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle ... and make recommendations for a new plan.”<sup>[13]</sup>

Towards this goal, the administration appointed a Blue Ribbon Commission on America’s Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission’s charter includes a requirement that it consider “[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed.”<sup>[14]</sup>

On January 26, 2012, the Blue Ribbon Commission issued its “Report to the Secretary of Energy” containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- “[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities”<sup>[15]</sup>
- “[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste.”<sup>[16]</sup>

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<sup>13</sup> Charter of the Blue Ribbon Commission on America’s Nuclear Future, “Objectives and Scope of Activities,” <http://www.brc.gov/index.php?q=page/charter>

<sup>14</sup> Ibid.

<sup>15</sup> “Blue Ribbon Commission on America’s Nuclear Future, Report to the Secretary of Energy,” [http://www.brc.gov/sites/default/files/documents/brc\\_finalreport\\_jan2012.pdf](http://www.brc.gov/sites/default/files/documents/brc_finalreport_jan2012.pdf), p. 32, January 2012

<sup>16</sup> Ibid., p.27

In January 2013, the DOE issued the “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” in response to the recommendations made by the Blue Ribbon Commission and as “a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel...”<sup>[17]</sup>

“With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”<sup>[18]</sup>

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)<sup>[19]</sup> ordering NRC to comply with federal law and resume its review of DOE’s Yucca Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE’s environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

A federal appeals court has ruled that DOE’s obligation to take possession of spent nuclear fuel is unconditional and cannot be excused either by the absence of a repository or by a claim of unavoidable delay. FPL filed a lawsuit in 2004 claiming

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<sup>17</sup> “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” U.S. DOE, January 11, 2013

<sup>18</sup> *Ibid.*, p.2

<sup>19</sup> U.S. Court of Appeals for the District Of Columbia Circuit, In Re: Aiken County, et al, Aug. 2013, [http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/\\$file/11-1271-1451347.pdf](http://www.cadc.uscourts.gov/internet/opinions.nsf/BAE0CF34F762EBD985257BC6004DEB18/$file/11-1271-1451347.pdf)

damages for DOE's failure to perform as originally prescribed in the standard disposal contract. On March 31, 2009, FPL executed a Settlement Agreement with the DOE and the Department of Justice (DoJ). In the Agreement, FPL settled the lawsuit in exchange for payments. The payments are intended to cover those costs incurred for managing and storing the spent fuel that it would not have incurred but for DOE's delay in performance.

While the DOE is responsible for the costs incurred until it fulfills its obligation, certain assumptions are needed to assess the financial impact on the identified decommissioning cost scenarios. The assumptions and methodology employed to quantify the expected level of compensation are outlined in Section 3.8.

Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program assumes that spent fuel allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.<sup>[20]</sup> FPL's current spent fuel management plan for Turkey Point spent fuel is based in general upon the first assemblies being removed from the site in 2031. With an estimated, maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, completion of the removal of fuel from the site is conservatively projected to be in the year 2072. Consequently, costs are included within the estimates for the long-term caretaking of the spent fuel at the Turkey Point site until the year 2072. Different DOE acceptance schedules may result in different completion dates.

NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE.<sup>[21]</sup> Interim storage of the fuel, until the DOE has completed

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<sup>20</sup> In 2008, the DOE issued a report to Congress in which it concluded that it did not have authority, under present law, to accept spent nuclear fuel for interim storage from decommissioned commercial nuclear power reactor sites. However, the Blue Ribbon Commission, in its final report, noted that: "[A]ccepting spent fuel according to the OFF [Oldest Fuel First] priority ranking instead of giving priority to shutdown reactor sites could greatly reduce the cost savings that could be achieved through consolidated storage if priority could be given to accepting spent fuel from shutdown reactor sites before accepting fuel from still-operating plants. .... The magnitude of the cost savings that could be achieved by giving priority to shutdown sites appears to be large enough (i.e., in the billions of dollars) to warrant DOE exercising its right under the Standard Contract to move this fuel first." For planning purposes only, this estimate does not assume that Turkey Point, as a permanently shutdown plant, will receive priority; the fuel removal schedule assumed in this estimate is based upon DOE acceptance of fuel according to the "Oldest Fuel First" priority ranking. The plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance.

<sup>21</sup> U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses"

the transfer, will be in the fuel handling buildings' spent fuel storage pools, as well as at the on-site ISFSI.

FPL's position is that the DOE has a contractual obligation to accept Turkey Point's fuel far earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the plant's life if, contrary to its contractual obligation, the DOE has not performed earlier.

### Site Restoration

The efficient removal of the contaminated materials at the site may result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities can substantially damage power block structures, potentially weakening the footings and structural supports. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized is more efficient and less costly than if the process is deferred.

Consequently, this study assumes that the structures addressed by this analysis are removed to a nominal depth of three feet below grade. The site is then graded and stabilized.

### Summary

The estimates to decommission Turkey Point assume the removal of all contaminated and activated plant components and structural materials such that the owner may then have unrestricted use of the site with no further requirements for an operating license. Low-level radioactive waste, other than GTCC waste, is sent to a commercial processor for treatment/conditioning or to a controlled disposal facility.

Decommissioning is accomplished within the 60-year period required by current NRC regulations. In the interim, the spent fuel remains in storage at the site until such time that the transfer to a DOE facility is complete.

The alternatives evaluated in this analysis are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendices C

and D. The major cost components are also identified in the cost summary provided at the end of this section.

The cost elements in the estimates for the DECON and SAFSTOR alternatives are assigned to one of three subcategories: NRC License Termination (radiological remediation), Spent Fuel Management, and Site Restoration. The subcategory “NRC License Termination” is used to accumulate costs that are consistent with “decommissioning” as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the reactors’ operating licenses, recognizing that there may be some additional cost impact from spent fuel management. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). Section 3.5.1 provides the basis for the ISFSI decommissioning cost, delineated in Appendix E.

The “Spent Fuel Management” subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the DOE and/or ISFSI for interim storage, as well as the transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pools and the management of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any cost related to the final disposal of the spent fuel. Under the terms of the settlement agreement with the DOE, there are activities and costs identified in the decommissioning cost study that are expected to be eligible for reimbursement (depending upon the timing of the activities). The activities are identified in Section 3.8 and the costs in Tables 3.6 through 3.8.

“Site Restoration” is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Consequently, this study assumes that the site structures addressed by this analysis are removed to a depth of three feet and backfilled to conform to local grade.

It should be noted that the costs assigned to these subcategories are allocations. Delegation of cost elements is for the purposes of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction between the activities in the three subcategories. For example, an owner may decide to remove non-contaminated structures early in the project to improve access to highly contaminated facilities or plant components. In these instances, the non-contaminated removal costs could be reassigned from Site Restoration to an NRC License Termination support activity. However, in general, the allocations represent a reasonable accounting of

those costs that can be expected to be incurred for the specific subcomponents of the total estimated program cost, if executed as described.

As noted within this document, the estimates were developed and costs are presented in 2015 dollars. As such, the estimates do not reflect the escalation of costs (due to inflationary and market forces) over the remaining operating life of the plant or during the decommissioning period.

**DECON COST SUMMARY**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Unit 3	Unit 4	Total
Decontamination	9,740	13,084	22,823
Removal	80,064	102,184	182,248
Packaging	23,942	24,604	48,546
Transportation	24,571	26,349	50,920
Waste Disposal	74,770	79,418	154,188
Off-site Waste Processing	11,931	14,971	26,902
Program Management <sup>[1]</sup>	275,531	296,650	572,181
Site Security	110,389	120,897	231,286
Spent Fuel Pool Isolation	12,750	8,500	21,250
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	129,241	160,116	289,358
Insurance and Regulatory Fees	24,247	22,102	46,349
Energy	19,874	20,714	40,588
Characterization and Licensing Surveys	20,350	16,956	37,306
Property Taxes	1,517	1,073	2,589
Miscellaneous Equipment	7,084	7,595	14,679
Fixed Overhead	15,565	14,078	29,643
INPO, NEI Fees	3,954	3,665	7,619
Florida LLRW Inspection Fee	515	560	1,074
<b>Total <sup>[3]</sup></b>	<b>846,034</b>	<b>933,515</b>	<b>1,779,550</b>

Cost Element	Unit 3	Unit 4	Total
License Termination	580,783	624,798	1,205,581
Spent Fuel Management <sup>[4]</sup>	224,586	255,084	479,670
Site Restoration	40,665	53,633	94,298
<b>Total <sup>[3]</sup></b>	<b>846,034</b>	<b>933,515</b>	<b>1,779,550</b>

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

**SAFSTOR COST SUMMARY**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Unit 3	Unit 4	Total
Decontamination	7,935	10,159	18,095
Removal	81,523	102,894	184,416
Packaging	16,790	17,081	33,871
Transportation	20,811	21,548	42,359
Waste Disposal	59,254	61,077	120,331
Off-site Waste Processing	13,487	17,610	31,097
Program Management <sup>[1]</sup>	346,128	363,348	709,476
Site Security	143,670	138,232	281,902
Spent Fuel Pool Isolation	12,750	8,500	21,250
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	122,550	153,389	275,939
Insurance and Regulatory Fees	61,037	58,710	119,747
Energy	40,521	40,622	81,143
Characterization and Licensing Surveys	20,856	17,578	38,434
Property Taxes	1,855	1,411	3,266
Miscellaneous Equipment	17,010	21,088	38,098
Fixed Overhead	45,292	43,321	88,613
INPO, NEI Fees	5,964	5,556	11,520
Florida LLRW Inspection Fee	495	516	1,011
<b>Total <sup>[3]</sup></b>	<b>1,017,926</b>	<b>1,082,641</b>	<b>2,100,567</b>

Cost Element	Unit 3	Unit 4	Total
License Termination	718,777	726,047	1,444,824
Spent Fuel Management <sup>[4]</sup>	258,513	303,364	561,877
Site Restoration	40,637	53,230	93,866
<b>Total <sup>[3]</sup></b>	<b>1,017,926</b>	<b>1,082,641</b>	<b>2,100,567</b>

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

## **1. INTRODUCTION**

This report presents estimates of the cost to decommission the Turkey Point Nuclear Plant, Units 3 and 4, (Turkey Point), assuming a 60-year operating life for the selected decommissioning scenarios following a scheduled cessation of plant operations. The estimates are designed to provide Florida Power & Light Company (FPL) with the information to assess its current decommissioning liability, as it relates to Turkey Point.

The analysis relies upon site-specific, technical information from an earlier evaluation prepared in 2010,<sup>[1]</sup>\* updated to reflect current assumptions pertaining to the disposition of the nuclear plant and relevant industry experience in undertaking such projects. The costs are based on several key assumptions in areas of regulation, component characterization, high-level radioactive waste management, low-level radioactive waste disposal, performance uncertainties (contingency) and site restoration requirements.

The analysis is not an engineering evaluation, but estimates prepared in advance of the detailed planning required to carry out the decommissioning of the nuclear units. It may also not reflect the actual plan to decommission Turkey Point; the plan may differ from the assumptions made in this analysis based on facts that exist at the time of decommissioning.

The 2010 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. No changes to the plant inventory over the past five years, that would impact decommissioning, were identified. Two new buildings, LLW storage building for B & C waste and maintenance professional facility, were added to structural inventory.

### **1.1 OBJECTIVES OF STUDY**

The objectives of this study are to prepare comprehensive estimates of the costs to decommission Turkey Point, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities.

Consistent with NRC guidance indicating that decommissioning funding should be based on the current license life of the plant, the cessation of

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\* References provided in Section 7 of the document

operations is assumed to be on July 19, 2032 and April 10, 2033 for Units 3 and 4, respectively.

## **1.2 SITE DESCRIPTION**

The Turkey Point site is located on the shore of Biscayne Bay, approximately 25 miles south of Miami, Florida, 8 miles east of Florida City and 9 miles southeast of Homestead, Florida. Units 3 and 4 are essentially identical pressurized water reactors. The two nuclear units are located adjacent to two oil and gas fired units (which are not considered in this study). The nuclear units were designed and constructed by Bechtel Energy Corporation.

The nuclear steam supply systems consist of a pressurized water reactor system designed by Westinghouse Electric Corporation. The reactor coolant system consists of three similar heat transfer loops connected in parallel to the reactor pressure vessel. Each loop contains a reactor coolant pump, steam generator, and associated piping and valves. In addition, the system includes a pressurizer, a pressurizer relief tank, interconnecting piping, and the instrumentation necessary for operational control. All system equipment, except for the digital pressure indicator, three wide range pressure transmitters, and the containment isolation and process actuated valves located in the lines connected to the pressurizer relief tank, are located in the containment building.

The containment is a steel lined, post-tensioned, reinforced-concrete structure consisting of a vertical cylinder with a hemispherical dome, supported on a flat foundation mat. The cylinder and dome are post-tensioned with high-strength unbounded wire tendons.

Heat produced in the reactor is converted to electrical energy by the steam and power conversion system. The function of the turbine generator is to receive steam from the steam generators, economically convert a portion of the thermal energy contained in the steam to electrical energy, and provide extract steam for six stages of feedwater heating. The turbine generator serves no safety function and has two reheaters before entering the low pressure turbines. The exhaust steam from the two low pressure turbines is condensed in the condenser.

Heat rejected in the main condensers is removed by the circulating water system. The system provides cooling water for removal of heat loads developed in the plant's main condenser which condenses the steam exhaust from the turbine. Cooling water for the condenser is supplied by a network of cooling canals.

Modifications to the plant during the most recent refueling outages increased the power output for each unit. The Extended Power Uprate (EPU) resulted in a 15-percent increase. The original licensed core rated thermal power level was 2,200 megawatts-thermal (MWt), and after a 4.5-percent stretch power uprate in 1996, the licensed thermal power rating was increased to 2,300 MWt. The current licensed thermal power rating, after the EPU modifications, is 2,644 MWt. The corresponding design electrical ratings are 831 and 840 megawatts-electrical for Units 3 and 4, respectively. The impact of the EPU (e.g., from increased neutron fluence), although not significant in decommissioning, is considered in this analysis.

### **1.3 REGULATORY GUIDANCE**

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.<sup>[2]</sup> This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors,"<sup>[3]</sup> which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the plant's systems, structures and facilities are removed or decontaminated to levels that permit the site to be released for unrestricted use shortly after the cessation of plant operations, while the SAFSTOR and ENTOMB alternatives defer the process.

The rule also placed limits on the time allowed to complete the decommissioning process. For all alternatives, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. At the conclusion of a 60-year dormancy period (or longer if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. However, with rulemaking permitting the controlled release of a site,<sup>[4]</sup> the NRC did re-evaluate the alternative. The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most reactors. The staff also found that additional rulemaking would be needed before this option could be treated as a generic alternative.

The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments.<sup>[5]</sup> However, the NRC's staff has subsequently recommended that rulemaking be deferred, based upon several factors (e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities), at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

In 1996, the NRC published revisions to the general requirements for decommissioning nuclear power plants.<sup>[6]</sup> When the decommissioning regulations were adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after the decision to cease operations. Certification will also be required once the fuel is permanently removed from the reactor vessel. Submittal of these notices, along with related changes to Technical Specifications, entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR

describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee is required to submit an application to the NRC to terminate the license, which will include a license termination plan (LTP).

In 2011, the NRC published amended regulations to improve decommissioning planning and thereby reduce the likelihood that any current operating facility will become a legacy site.<sup>[7]</sup> The amended regulations require licensees to conduct their operations to minimize the introduction of residual radioactivity into the site, which includes the site's subsurface soil and groundwater. Licensees also may be required to perform site surveys to determine whether residual radioactivity is present in subsurface areas and to keep records of these surveys with records important for decommissioning. The amended regulations require licensees to report additional details in their decommissioning cost estimate as well as requiring additional financial reporting and assurances. The additional details, including a decommissioning estimate for the Independent Spent Fuel Storage Installation (ISFSI), are included in this study.

### 1.3.1 High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act" (NWPA) in 1982, assigning the federal government's long-standing responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. It was to begin accepting spent fuel by January 31, 1998; however, to date no progress in the removal of spent fuel from commercial generating sites has been made.

Today, the country is at an impasse on high-level waste disposal, even with the License Application for a geologic repository submitted by the DOE to the NRC in 2008. The current administration has cut the budget for the repository program while promising to "conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle ... and make recommendations for a new plan."

Towards this goal, the administration appointed a Blue Ribbon Commission on America's Nuclear Future (Blue Ribbon Commission) to make recommendations for a new plan for nuclear waste disposal. The Blue Ribbon Commission's charter includes a requirement that it consider "[o]ptions for safe storage of used nuclear fuel while final disposition pathways are selected and deployed."<sup>[8]</sup>

On January 26, 2012, the Blue Ribbon Commission issued its “Report to the Secretary of Energy” containing a number of recommendations on nuclear waste disposal. Two of the recommendations that may impact decommissioning planning are:

- “[T]he United States [should] establish a program that leads to the timely development of one or more consolidated storage facilities”
- “[T]he United States should undertake an integrated nuclear waste management program that leads to the timely development of one or more permanent deep geological facilities for the safe disposal of spent fuel and high-level nuclear waste.”<sup>[9]</sup>

In January 2013, the DOE issued the “Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste,” in response to the recommendations made by the Blue Ribbon Commission and as “a framework for moving toward a sustainable program to deploy an integrated system capable of transporting, storing, and disposing of used nuclear fuel...” <sup>[10]</sup>

“With the appropriate authorizations from Congress, the Administration currently plans to implement a program over the next 10 years that:

- Sites, designs and licenses, constructs and begins operations of a pilot interim storage facility by 2021 with an initial focus on accepting used nuclear fuel from shut-down reactor sites;
- Advances toward the siting and licensing of a larger interim storage facility to be available by 2025 that will have sufficient capacity to provide flexibility in the waste management system and allows for acceptance of enough used nuclear fuel to reduce expected government liabilities; and
- Makes demonstrable progress on the siting and characterization of repository sites to facilitate the availability of a geologic repository by 2048.”

The NRC’s review of DOE’s license application to construct a geologic repository at Yucca Mountain was suspended in 2011 when the Administration significantly reduced the budget for completing that work. However, the US Court of Appeals for the District of Columbia Circuit issued a writ of mandamus (in August 2013)<sup>[11]</sup> ordering NRC to comply with federal law and resume its review of DOE’s Yucca

Mountain repository license application to the extent allowed by previously appropriated funding for the review. That review is now complete with the publication of the five-volume safety evaluation report. A supplement to DOE's environmental impact statement and an adjudicatory hearing on the contentions filed by interested parties must be completed before a licensing decision can be made.

A federal appeals court has ruled that DOE's obligation to take possession of spent nuclear fuel is unconditional and cannot be excused either by the absence of a repository or by a claim of unavoidable delay. FPL filed a lawsuit in 2004 claiming damages for DOE's failure to perform as originally prescribed in the standard disposal contract. On March 31, 2009, FPL executed a Settlement Agreement with the DOE and the Department of Justice (DoJ). In the Agreement, FPL settled the lawsuit in exchange for payments. The payments are intended to cover those costs incurred for managing and storing the spent fuel that it would not have incurred but for DOE's delay in performance.

While the DOE is responsible for the costs incurred until it fulfills its obligation, certain assumptions are needed to assess the financial impact on the identified decommissioning cost scenarios. The assumptions and methodology employed to quantify the expected level of compensation are outlined in Section 3.8.

Completion of the decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site in a timely manner. DOE's repository program assumes that spent fuel allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.<sup>[12]</sup> FPL's current spent fuel management plan for Turkey Point spent fuel is based in general upon the first assemblies being removed from the site in 2031. With an estimated, maximum rate of transfer of 3,000 metric tons of uranium (MTU)/year, completion of the removal of fuel from the site is conservatively projected to be in the year 2072. Consequently, costs are included within the estimates for the long-term caretaking of the spent fuel at the Turkey Point site until the year 2072. Different DOE acceptance schedules may result in different completion dates.

NRC requires that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the DOE.<sup>[13]</sup> Interim storage of the fuel, until the DOE has completed the transfer, will be in the fuel handling buildings' spent fuel storage pools, as well as at the on-site ISFSI.

FPL's position is that the DOE has a contractual obligation to accept Turkey Point's fuel far earlier than the projections set out above consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the plant's life if, contrary to its contractual obligation, the DOE has not performed earlier.

### 1.3.2 Low-Level Radioactive Waste Management

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,<sup>[14]</sup> and its Amendments of 1985,<sup>[15]</sup> the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

With the exception of Texas, no new compact facilities have been successfully sited, licensed, and constructed. The Texas Compact disposal facility is now operational and waste is being accepted from generators within the Compact by the operator, Waste Control Specialists (WCS). The facility is also able to accept limited quantities of non-Compact waste.

Disposition of the various waste streams produced by the decommissioning process considered all options and services currently available to FPL. The majority of the low-level radioactive waste designated for direct disposal (Class A<sup>[16]</sup>) can be sent to EnergySolutions' facility in Clive, Utah. Therefore, disposal costs for Class A waste were based upon FPL's Life of Plant Agreement with EnergySolutions. This facility is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream.

The WCS facility is able to receive the Class B and C waste. As such, for this analysis, Class B and C waste was assumed to be shipped to the WCS facility and disposal costs for the waste were based upon published rates for non-Compact generators.

The dismantling of the components residing closest to the reactor core generates radioactive waste that may be considered unsuitable for

shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance.

For purposes of this analysis only, the GTCC radioactive waste is assumed to be packaged and disposed of in a similar manner as high-level waste and at a cost equivalent to that envisioned for the spent fuel. The GTCC is packaged in the same canisters used for spent fuel and either stored on site or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the metallic waste generated during decommissioning may potentially be contaminated by radioactive materials. Rather than designating this large volume for controlled disposal, this analysis assumes that the material is sent to a licensed facility for characterization and processing. Processing is routinely used to reduce the volume, for example, by component disassembly, sorting, compaction and metal melt. The estimates reflect the savings from waste recovery/volume reduction.

### 1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination,"<sup>[17]</sup> amending 10 CFR Part 20. This subpart provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The decommissioning estimates assume that the Turkey Point site will be remediated to a residual level consistent with the NRC-prescribed level. It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered acceptable in site remediation. The EPA has two limits that apply to

radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).<sup>[18]</sup> An additional and separate limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water.<sup>[19]</sup>

On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU)<sup>[20]</sup> provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

## **2. DECOMMISSIONING ALTERNATIVES**

Detailed cost estimates were developed to decommission Turkey Point based upon the approved decommissioning alternatives: DECON and SAFSTOR. Although the alternatives differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

Two decommissioning scenarios were evaluated for Turkey Point. The scenarios selected are representative of alternatives currently available to the owner and are defined as follows:

1. **DECON:** The operating licenses for Units 3 and 4 currently expire in July 2032 and April 2033, respectively. The first scenario assumes that decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI so as to facilitate decontamination and dismantling activities within the fuel handling buildings. Spent fuel storage operations continue at the site until the transfer of the fuel to the DOE is complete, assumed to be in the year 2072.
2. **SAFSTOR:** The units are placed into safe-storage shortly after the permanent cessation of operations and defueling. Spent fuel that cannot be directly transferred to the DOE from the storage pools is relocated to the ISFSI to minimize caretaking costs. Decommissioning is deferred beyond the fuel storage period to the maximum extent possible; termination of the licenses would conclude within the required 60-year period. As with the DECON scenario, decommissioning activities at the two units are sequenced and integrated so as to minimize the total duration of the physical dismantling processes.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work, i.e., engineering and planning at the time of decommissioning.

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both plant and licensee from reactor operations (i.e., power production) to facility de-activation and closure. During the first phase, notification is to be provided to the NRC

certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee is then prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for Turkey Point are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in the projected expenditures.

## **2.1 DECON**

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to an off-site disposal facility.

### **2.1.1 Period 1 - Preparations**

In anticipation of the cessation of plant operations, detailed preparations are undertaken to provide a smooth transition from plant operations to site decommissioning. Through implementation of a staffing transition plan, the organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications applicable to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

#### **Engineering and Planning**

The PSDAR, required prior to or within two years of permanent cessations of operations, provides a description of the licensee's planned decommissioning activities, a timetable, a site-specific decommissioning cost estimate, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local

hearing to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure (10 CFR §50.59 establishes the conditions under which licensees may make changes to the facility or procedures and conduct test or experiments, i.e., without prior NRC approval). Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor coolant system piping, steam generators, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

- foreclose release of the site for possible unrestricted use,
- significantly increase decommissioning costs,
- cause any significant environmental impact, or
- violate the terms of the licensee's existing license.

Existing operational technical specifications are reviewed and modified to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities is also considered. Typically, a licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than that bounded by previously evaluated environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, and work packages and procedures, would be assembled to support the proposed decontamination and dismantling activities.

### Site Preparations

Following final plant shutdown, and in preparation for actual decommissioning activities, the following activities are initiated:

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the reactor vessel and its internals), internal piping, and primary shield cores.
- Isolation of the spent fuel storage pools and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. The pools will remain operational for approximately five and one half years following the cessation of operations. During this time period, it is assumed that the spent fuel residing in the pools that cannot be directly transferred to the DOE will be moved to the ISFSI for interim storage.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.

#### 2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful release of the site from the 10 CFR §50 operating license(s), exclusive of the ISFSI. Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. For example, this will include a centralized processing area to facilitate equipment removal and component preparations for off-site disposal.
- Reconfiguration and modification of site structures and facilities as needed to support decommissioning operations. This will include the upgrading of roads (on- and off-site), as required, to facilitate hauling and transport. Modifications may be required to the containment

structure to facilitate access of large/heavy equipment. Modifications will also be required to the refueling area of the building to support the segmentation of the reactor vessel internals and component extraction.

- Transfer of the spent fuel from the storage pools to the DOE and/or ISFSI pad.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.
- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from reactor vessel head. Segmentation of the vessel closure head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks, i.e., by weight and activity. The operations are conducted under water using remotely operated tooling and contamination controls.
- Disassembly and segmentation of the remaining reactor internals, including the core shroud and lower core support assembly. Some material is expected to exceed Class C disposal requirements. As such, the segments will be packaged in modified fuel storage canisters for geologic disposal.
- Segmentation of the reactor vessel. A shielded platform is installed for segmentation as cutting operations are performed in-air using remotely operated equipment within a contamination control envelope. The water level is maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the

associated cubicles necessary for access and component extraction are removed.

- Removal of the steam generators and pressurizer for material recovery and controlled disposal. The generators will be moved to an on-site processing center, the steam domes removed and the internal components segregated for recycling. The lower shell and tube bundle will be packaged for direct disposal. These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized, e.g., with grout. Steel shielding will be added, as necessary, to those external areas of the package to meet transportation limits and regulations.

At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local hearing. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining plant systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).
- Removal of the steel liners from refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/ contaminated concrete.
- Surveys of the decontaminated areas of the containment structure.
- Remediation and removal of the contaminated equipment and material from the auxiliary and fuel buildings, and any other contaminated facility. Radiation and contamination controls will be utilized until residual levels indicate that the structures and equipment can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and

contaminated) located within these buildings. This activity facilitates surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.

- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the “Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).”<sup>[21]</sup> This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on the requested change to the operating license (that would release the property, exclusive of the ISFSI, for unrestricted use).

The NRC will amend the operating license(s) if it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the property (exclusive of the ISFSI) is suitable for release.

### 2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities can begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled, safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures including

the reactor, reactor auxiliary, and fuel handling buildings. Under certain circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and plant areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the plant.

It is not currently anticipated that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized on site is more efficient than if the process is deferred.

This cost study presumes that non-essential structures and site facilities are dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are removed to a nominal depth of three feet below grade. The site is then graded and stabilized.

Non-contaminated concrete rubble produced by demolition activities is processed to remove reinforcing steel and miscellaneous embedments. The processed material is used on site to backfill foundation voids or shipped off-site for conventional disposal as construction debris and/or recycled.

#### 2.1.4 ISFSI Operations and Decommissioning

For purposes only of this estimate, transfer of spent fuel to a DOE repository or interim facility is assumed to be exclusively from the ISFSI once the fuel pools have been emptied and the fuel handling buildings released for decommissioning. The ISFSI will continue to operate under a general license (10 CFR §50) following the amendment of the operating license(s) to release the adjacent (power block) property.

Assuming the DOE starts accepting fuel from the Turkey Point in 2031, transfer of spent fuel from the ISFSI is anticipated to begin in 2039, and continue through the year 2072. This assumption is made for purposes of this estimate, although it is acknowledged that the plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission will terminate the Part 50 license if it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license for the ISFSI.

## **2.2 SAFSTOR**

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems that are not required to support the spent fuel pools or site surveillance and security are drained, de-energized, and secured. Minimal cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative, although shorter time period is expected for these activities due to the more limited work scope. Site preparations are also similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

### **2.2.1 Period 1 - Preparations**

Preparations for long-term storage include the planning for permanent defueling of the reactor, revision of technical specifications appropriate to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

The process of placing the plant in safe-storage includes, but is not limited to, the following activities:

- Isolation of the spent fuel storage services and fuel handling systems so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities

are scheduled around the fuel handling systems to the greatest extent possible.

- Transferring of the spent fuel from the storage pools to the DOE or to the ISFSI, following the minimum required cooling period in the spent fuel pools.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.
- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessel, with the internals left in place and the vessel head secured.
- Draining and de-energizing non-essential, contaminated systems with decontamination as required for future maintenance and inspection.
- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey of the plant, posting warning signs where appropriate.
- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.
- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

#### 2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance,

inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented and/or detected and controlled. Appropriate emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal plant operations.

Security during the dormancy period is conducted primarily to prevent unauthorized entry and to protect the public from the consequences of its own actions. The security fence, sensors, alarms, and other surveillance equipment are maintained throughout the dormancy period. Fire and radiation alarms are also functional.

Consistent with the DECON scenario, the spent fuel storage pools are emptied within five and one half years of the cessation of operations. It is assumed that the transfer of the spent fuel from the site to the DOE begins in 2031. The transfer continues throughout the dormancy period until completed in 2072. This assumption is made for purposes of this estimate, although it is acknowledged that the plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance. If the assumption of transfer of fuel from the ISFSI to DOE is incorrect, it is assumed that DOE will have liability for costs incurred to transfer the fuel to DOE-supplied containers and to dispose of existing containers. Once emptied, the ISFSI is secured for storage and decommissioned along with the power block structures in Period 4.

After a period of storage (such that license termination is accomplished within 60 years of final shutdown), it is required that the licensee submit an application to terminate the license, along with a LTP (described in Section 2.1.2), thereby initiating the third phase.

### 2.2.3 Periods 3 and 4 - Delayed Decommissioning

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning

management organization. Final planning and the assembly of activity specifications and detailed work procedures are also initiated at this time.

Much of the work in developing a termination plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase and the follow-on decontamination and dismantling processes are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and this deferred scenario is the absence, in the latter, of any constraint on the dismantling process due to the operation of the spent fuel pools in the DECON option.

Variation in the length of the dormancy period are expected to have some effect upon the quantities of radioactive wastes generated from system and structure removal operations. Given the levels of radioactivity and spectrum of radionuclides expected from sixty years of plant operation, no plant process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone. However, due to the lower activity levels, a greater percentage of the waste volume can be designated for off-site processing and recovery.

The delay in decommissioning also yields lower working area radiation levels. As such, the estimate for this delayed scenario incorporates reduced ALARA controls for the SAFSTOR's lower occupational exposure potential.

Although the initial radiation levels due to  $^{60}\text{Co}$  will substantially decrease during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as  $^{94}\text{Nb}$ ,  $^{59}\text{Ni}$ , and  $^{63}\text{Ni}$ . Therefore, the dismantling procedures described for the DECON alternative would still be employed during this scenario. Portions of the biological shield wall will still be radioactive due to the presence of activated trace elements with long half-lives ( $^{152}\text{Eu}$  and  $^{154}\text{Eu}$ ). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

#### 2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities begin. Dismantling, as a continuation of the decommissioning process, is a cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost is consistent with that described for DECON, presuming the removal of structures and site facilities to a nominal depth of three feet below grade and the limited restoration of the site.

### **3. COST ESTIMATE**

The cost estimates prepared for decommissioning Turkey Point consider the unique features of the site, including the nuclear steam supply system, electric power generating systems, structures and supporting facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

#### **3.1 BASIS OF ESTIMATE**

The current estimates were developed using the site-specific, technical information relied upon in the decommissioning analysis prepared in 2010. This information was reviewed for the current analysis and updated as deemed appropriate. The site-specific considerations and assumptions used in the previous evaluation were also revisited. Modifications were incorporated where new information was available or experience from ongoing decommissioning programs provided viable alternatives or improved processes.

#### **3.2 METHODOLOGY**

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"<sup>[22]</sup> and the DOE "Decommissioning Handbook."<sup>[23]</sup> These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal (\$/cubic yard), steel removal (\$/ton), and cutting costs (\$/inch) are developed using local labor rates. The activity-dependent costs are estimated with the item quantities (cubic yards and tons), developed from plant drawings and inventory documents. Removal rates and material costs for the conventional disposition of components and structures rely upon information available in the industry publication, "Building Construction Cost Data," published by R.S. Means.<sup>[24]</sup>

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

This estimates reflect lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Oyster Creek, Connecticut Yankee, Crystal River, San Onofre and Vermont Yankee nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

#### Work Difficulty Factors

TLG has historically applied work difficulty adjustment factors (WDFs) to account for the inefficiencies in working in a power plant environment. WDFs are assigned to each unique set of unit factors, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

- Access Factor 10% to 20%
- Respiratory Protection Factor 10% to 50%
- Radiation/ALARA Factor 10% to 37%
- Protective Clothing Factor 10% to 30%
- Work Break Factor 8.33%

The factors and their associated range of values were developed in conjunction with the AIF/NESP-036 study. The application of the factors is discussed in more detail in that publication.

#### Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiological controlled areas. The resulting man-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities is based upon productivity information available from the "Building Construction Cost Data" publication. In the DECON alternative, dismantling of the fuel handling buildings' systems and decontamination of the spent fuel pools is also dependent upon the timetable for the transfer of the spent fuel assemblies from the pools to the DOE and/or ISFSI.

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field engineering, equipment rental, and support services such as quality control and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting costs.

### **3.3 IMPACT OF DECOMMISSIONING MULTIPLE REACTOR UNITS**

In estimating the near simultaneous decommissioning of two co-located reactor units there can be opportunities to achieve economies of scale, by sharing costs between units, and coordinating the sequence of work activities. There will also be schedule constraints, particularly where there are requirements for specialty equipment and staff, or practical limitations on when final status surveys can take place. For purposes of the estimates, Units 3 and 4 are assumed to be essentially identical. Common facilities have been assigned to Unit 4. A summary of the principal impacts are listed below.

- The sequence of work generally follows the principal that the work is done at Unit 3 first, followed by similar work at Unit 4. This permits the experience gained at Unit 3 to be applied by the workforce at the second unit. It should be noted however, that the estimates do not consider productivity improvements at the second unit, since there is little documented experience with decommissioning two units simultaneously. The work associated with developing activity specifications and procedures can, however, be considered essentially identical between the two units, therefore the second unit costs are assumed to be a fraction of the first unit (e.g., ~ 43% in DECON).
- Segmenting the reactor vessel and internals will require the use of special equipment. The decommissioning project will be scheduled such that Unit 4's reactor internals and vessel are segmented after the activities at Unit 3 have been completed, permitting the sharing of the cutting equipment.
- Some program management and support costs, particularly costs associated with the more senior positions, can be avoided with two reactors undergoing decommissioning simultaneously. As a result, the estimates are based on a "lead" unit that includes these senior positions, and a "second" unit that excludes these positions. The designation as lead is based on the unit undertaking the most complex tasks (for instance vessel segmentation) or performing tasks for the first time.
- The final radiological survey schedule is also affected by a two-unit decommissioning schedule. It would be considered impractical to try to

complete the final status survey of Unit 3, while Unit 4 still has ongoing radiological remediation work and waste handling in process. As such, the transfer of the spent fuel from the storage pools and subsequent decontamination of the fuel building is coordinated so as to synchronize the final status survey for the station.

- The final demolition of buildings at Units 3 and 4 are considered to take place concurrently.
- The first unit to enter decommissioning incurs the majority of site characterization costs.
- Shared systems and structures are generally assigned to Unit 4.
- Station costs such as emergency response fees, regulatory agency fees, corporate overhead, and insurance are generally allocated on an equal basis between the two units.
- Dormancy costs (to maintain the units in safe-storage) in the SAFSTOR scenario are allocated on an equal basis between the two units.

### **3.4 FINANCIAL COMPONENTS OF THE COST MODEL**

TLG's proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination, spent fuel management and site restoration.

#### **3.4.1 Contingency**

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook"<sup>[25]</sup> as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous

experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, contingency is included. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and guidelines are provided for a contingency percentage in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the plant.

Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

- Decontamination 50%
- Contaminated Component Removal 25%
- Contaminated Component Packaging 10%
- Contaminated Component Transport 15%
- Low-Level Radioactive Waste Disposal 25%
  
- Low-Level Radioactive Waste Processing 15%
- Reactor Segmentation 75%
- Nuclear Steam Supply System Component Removal 25%
- Reactor Waste Packaging 25%
- Reactor Waste Transport 25%
  
- Reactor Vessel Component Disposal 50%
- GTCC Disposal 15%
- Non-Radioactive Component Removal 15%
- Heavy Equipment and Tooling 15%
- Supplies 25%
  
- Engineering 15%
- Energy 15%
- Construction 15%

- Insurance, Taxes and Fees 10%
- Staffing 15%
  
- Radiological Characterization and Termination Surveys 30%
- Operations and Maintenance Expenses 15%
- ISFSI Decommissioning 25%

The contingency values are applied to the appropriate components of the estimates on a line item basis. A composite value is then reported at the end of each detailed estimate (as provided in Appendix C and D).

### 3.4.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term “financial risk.” Included within the category of financial risk are:

- Transition activities and costs: ancillary expenses associated with reducing the size of the labor force (50% to 80%) shortly after the cessation of plant operations, added cost for worker separation packages throughout the decommissioning program, national or company-mandated retraining, and retention incentives for key personnel.
- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in plant inventory or configuration not indicated by the as-built drawings.
- Regulatory changes, for example, affecting worker health and safety, site release criteria, waste transportation, and disposal.

- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition, or in the timetable for such, or the start and rate of acceptance of spent fuel by the DOE).
- Pricing changes for basic inputs such as labor, energy, materials, and waste disposal.

This cost study does not add any additional costs to the estimate for financial risk, since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk are revisited periodically and addressed through repeated revisions or updates of the base estimates.

### **3.5 SITE-SPECIFIC CONSIDERATIONS**

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impact of the considerations identified below is included in this cost study.

#### **3.5.1 Spent Fuel Management**

The cost to dispose the spent fuel generated from plant operations is not reflected within the estimates to decommission Turkey Point. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the Nuclear Waste Policy Act. As such, the disposal cost is financed by a surcharge paid into the DOE's waste fund during operations. On November 19, 2013, the U.S. Court of Appeals for the D.C. Circuit ordered the Secretary of the Department of Energy to suspend collecting annual fees for nuclear waste disposal from nuclear power plant operators until the DOE has conducted a legally adequate fee assessment.

The NRC does, however, requires licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactor site until title of the fuel is transferred to the Secretary of Energy. This requirement is prepared for through inclusion of certain high-level waste cost elements within the estimates, as described below.

Completion of the decommissioning process is highly dependent upon the DOE's ability to remove spent fuel from the site. The timing for removal of spent fuel from the site is based upon the DOE's most recently published annual acceptance rates of 400 MTU/year for year 1,

3,800 MTU total for years 2 through 4 and 3,000 MTU/year for year 5 and beyond. The DOE contracts provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing priority acceptance from permanently shutdown nuclear reactors. Because it is unclear how these mechanisms may operate once DOE begins accepting spent fuel from commercial reactors, this study assumes that DOE will accept spent fuel in an oldest fuel first order.

### ISFSI

An ISFSI, which is operated under the plant's general license, has been constructed to support management of the spent fuel during operations. The facility is assumed to be available to support spent fuel management once the units cease operation, until the DOE is able to removal all spent fuel from the site.

The ISFSI will continue to operate throughout decommissioning, and beyond the termination of the operating license in the DECON decommissioning alternative, until such time that the transfer of spent fuel to the DOE can be completed. Assuming, conservatively, that DOE begins to remove spent fuel from the site in 2031, the process is expected to be completed by the year 2072. The scenario is similar for the SAFSTOR alternative; however, based upon the expected completion date for fuel transfer, the ISFSI will be emptied prior to the commencement of decommissioning operations.

Post-shutdown and maintenance costs for the spent fuel pools and the ISFSI are also included and address the cost for staffing the facility, as well as security, insurance, and licensing fees. Costs are provided for the final disposition of the facilities once the transfer is complete.

### Canister Design

A Transnuclear NUHOMS<sup>®</sup>-32PT system (with a 32 fuel assembly capacity) is assumed for future acquisitions. For fuel transferred directly from the pools to the DOE, the DOE is assumed to provide Transport, Aging and Disposal (TAD) canisters with a 32 assembly capacity. DOE has not provided details about the TAD canisters other than assembly capacity.

### Canister Loading and Transfer

The estimates include the cost for the labor and equipment to transfer and load each spent fuel canister into the DOE transport cask or to the ISFSI from the wet storage pools. Since the DOE has not published details about its cask system, this rough estimate is necessary. However, use of this estimate should not be used to infer that TLG has any detailed information on the cask system DOE will ultimately provide.

### Operations and Maintenance

The estimates include the cost of operating and maintaining the spent fuel pools and the ISFSI, respectively. Pool operations are expected to continue approximately five and one half years after the cessation of operations. ISFSI operating costs are based upon a 39 year period of operations following the shutdown of Unit 4.

### ISFSI Decommissioning

In accordance with 10 CFR §72.30, licensees must have a proposed decommissioning plan for the ISFSI site and facilities that includes a cost estimate for the plan. The plan should contain sufficient information on the proposed practices and procedures for the decontamination of the ISFSI and for the disposal of residual radioactive materials after all spent fuel, high-level radioactive waste, and reactor-related GTCC waste have been removed.

A multi-purpose (storage and transport) dry shielded canister (DSC) with a horizontal storage module (HSM) is used as a basis for the cost analyses. The HSMs are assumed to have some level of neutron-induced activation as a result of the long-term storage of the fuel, i.e., to levels exceeding free-release limits. As an allowance, a total of 10 NUHOMS modules are assumed to be affected, i.e., contain residual radioactivity. The allowance is based upon the number of modules required for the final core off-load (i.e., 157 offloaded assemblies, 32 assemblies per cask) which results in 5 DSCs per unit. It is assumed that these are the final modules offloaded; consequently they have the least time for radioactive decay of the neutron activation products.

No contamination or activation of the ISFSI pad is assumed. It would be expected that this assumption would be confirmed as a result of good radiological practice of surveying potentially impacted areas after each spent fuel transfer campaign. As such, only verification surveys are

included for the pads in the decommissioning estimate. The estimate is limited to costs necessary to terminate the ISFSI's NRC license and meet the §20.1402 criteria for unrestricted use.

In accordance with the specific requirements of 10 CFR §72.30 for the ISFSI work scope, the cost estimate for decommissioning the ISFSI reflects: 1) the cost of an independent contractor performing the decommissioning activities; 2) an adequate contingency factor; and 3) the cost of meeting the criteria for unrestricted use. The cost summary for decommissioning the ISFSIs is presented in Appendix E.

### GTCC

The dismantling of the reactor internals is expected to generate radioactive waste considered unsuitable for shallow land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. Although the DOE is responsible for disposing of GTCC waste, any costs for that service have not been determined. For purposes of this estimate, the GTCC radioactive waste has been assumed to be packaged in the same canisters used to store spent fuel and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel. The number of canisters required and the packaged volume for GTCC was based upon experience at Maine Yankee (e.g., the constraints on loading as identified in the canister's certificate of compliance).

It is assumed that the DOE would not accept this waste prior to completing the transfer of spent fuel. Therefore, until such time the DOE is ready to accept GTCC waste, it is assumed that this material would remain in storage at the Turkey Point site (for the DECON alternative). In the SAFSTOR scenario, the GTCC material is shipped directly to a DOE facility as it is generated since the fuel has been removed from the site prior to the start of decommissioning.

#### 3.5.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is

performed in the refueling canal, where a turntable and remote cutter are installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations dictate the segmentation and packaging methodology.

Intact disposal of reactor vessel shells has been successfully demonstrated at several of the sites that have been decommissioned. Access to navigable waterways has allowed these large packages to be transported to the Barnwell disposal site with minimal overland travel.

Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact package (including the internals). However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,
- there were no man-made or natural terrain features between the plant site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

It is not known whether this option will be available when the Turkey Point plant ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, the study assumes that the reactor vessel will require segmentation, as a bounding condition.

### 3.5.3 Primary System Components

In the DECON scenario, the reactor coolant system components are assumed to be decontaminated using chemical agents prior to the start of dismantling operations. This type of decontamination can be expected to have a significant ALARA impact, since in this scenario the removal work is done within the first few years of shutdown. A decontamination factor (average reduction) of 10 is assumed for the process. Disposal of the decontamination solution effluent is included within the estimate as a "process chemical waste" charge. In the SAFSTOR scenario, radionuclide decay is expected to provide the same benefit and, therefore, a chemical decontamination is not included.

The following discussion deals with the removal and disposition of the steam generators, but the techniques involved are also applicable to other large components, such as heat exchangers, component coolers, and the pressurizer. The steam generators' size and weight, as well as their location within the reactor building, will ultimately determine the removal strategy.

A trolley crane is set up for the removal of the generators. It can also be used to move portions of the steam generator cubicle walls and floor slabs from the reactor building to a location where they can be decontaminated and transported to the material handling area. Interferences within the work area, such as grating, piping, and other components are removed to create sufficient laydown space for processing these large components.

The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they are lowered onto a dolly. Each generator is rotated into the horizontal position for extraction from the containment and placed onto a multi-wheeled vehicle for transport to an on-site processing and storage area.

The generators are disassembled on-site with the steam domes and lightly contaminated subassemblies designated for off-site recycling. The more highly contaminated lower assembly containing the tube sheet and tube bundle are packaged for direct disposal. The interior volume is filled with low-density cellular concrete for stabilization of the internal contamination. Each component is then loaded onto a barge for transport to an intermediate processing facility then shipped by rail to the disposal facility.

The original steam generators have been replaced at both units. The lower assemblies of six retired steam generators currently stored at the site will be removed from their storage facility and disposed of along with the installed generators.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

#### 3.5.4 Main Turbine and Condenser

The main turbine is dismantled using conventional maintenance procedures. The turbine rotors and shafts are removed to a laydown area. The lower turbine casings are removed from their anchors by controlled demolition. The main condensers are also disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it is surveyed and designated for either decontamination or volume reduction, conventional disposal, or controlled disposal. Components are packaged and readied for transport in accordance with the intended disposition.

#### 3.5.5 Transportation Methods

Contaminated piping, components, and structural material other than the highly-activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.<sup>[26]</sup> The contaminated material will be packaged in Industrial Packages (IP-1, IP-2, or IP-3, as defined in 49 CFR 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported in accordance with 10 CFR Part 71, in Type B containers. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., <sup>137</sup>Cs, <sup>90</sup>Sr, or

transuranics) has been prevented from reaching levels exceeding those that permit the major reactor components to be shipped under current transportation regulations and disposal requirements.

Transport of the highly-activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, barge, rail, and/or multi-wheeled transporter.

Transportation costs for Class A radioactive material requiring controlled disposal are based upon the mileage to the EnergySolutions' facility in Clive, Utah. Transportation costs for the higher activity Class B and C radioactive material are based upon the mileage to the WCS facility in Andrews County, Texas. The transportation cost for the GTCC material is assumed to be contained within the disposal cost. Transportation costs for off-site waste processing are based upon the mileage to Oak Ridge, Tennessee. Truck transport costs are developed from published tariffs from Tri-State Motor Transit.<sup>[27]</sup>

### 3.5.6 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is processed to reduce the total cost of controlled disposal. Material meeting the regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning (preparing the material to meet the waste acceptance criteria of the disposal site) and recovery of the waste stream is performed off site at a licensed processing center. Any material leaving the site is subject to a survey and release charge, at a minimum.

The mass of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in the detailed Appendices C and D, and summarized in Section 5. The quantified waste summaries shown in these tables are consistent with 10 CFR Part 61 classifications. Commercially available steel containers

are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The volumes are calculated based on the exterior package dimensions for containerized material or a specific calculation for components serving as their own waste containers.

The more highly-activated reactor components will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly-activated materials (greater than Class A waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

The cost to dispose of the lowest level waste and the majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at *EnergySolutions* facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon FPL's current agreement with WCS for the Andrews County facility.

### 3.5.7 Site Conditions Following Decommissioning

The NRC will amend or terminate the site license if it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Building codes and environmental regulations will dictate the next step in the decommissioning process, as well as owner's own future plans for the site.

Only existing site structures are considered in the dismantling cost. Buildings severely damaged in decontamination process are removed to a nominal depth of three feet below grade. Concrete rubble generated from demolition activities is processed and made available as clean fill for the power block foundations. Excess construction debris is trucked off site as an alternative to onsite disposal.

A significant amount of the below grade piping is located around the perimeter of the power block. The estimate includes a cost to excavate this area to an average depth of four feet so as to expose the piping, duct

bank, conduit, and any near-surface grounding grid. The overburden is surveyed and stockpiled on site for future use in backfilling the below grade voids.

### **3.6 ASSUMPTIONS**

The following are the major assumptions made in the development of the estimates for decommissioning the site.

#### **3.6.1 Estimating Basis**

Decommissioning costs are reported in the year of projected expenditure; however, the values are provided in 2015 dollars. Costs are not inflated, escalated, or discounted over the periods of performance.

The 2010 plant inventory, the basis for the decontamination and dismantling requirements and cost, and the decommissioning waste streams, were reviewed for this analysis. No changes to the plant systems that would impact decommissioning were identified.

The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

#### **3.6.2 Labor Costs**

FPL will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. The licensee will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract personnel will provide engineering services, e.g., for preparing the activity specifications, work procedures, activation, and structural analyses, under the direction of the owner.

Reduction in the operating organization is assumed to be handled through normal staffing processes (e.g., reassignment and

outplacement). Severance costs are not included for the plant operating staff or for the decommissioning organization.

Personnel costs are based upon average salary information provided by FPL. Overhead costs are included for site and corporate support, reduced commensurate with the staffing of the project.

The craft labor required to decontaminate and dismantle the nuclear units is acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis. Costs for site administration, operations, construction, and maintenance personnel are based upon average salary information provided by FPL.

Security, while reduced from operating levels, is maintained throughout the decommissioning for access control, material control, and to safeguard the spent fuel (in accordance with the requirements of 10 CFR Part 37, Part 72, and Part 73). Security costs include provisions for recurring expenses. Once the fuel has been transferred to the DOE in 2072, the security organization will be reduced to Part 37 requirements.

### 3.6.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the plant is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., <sup>137</sup>Cs, <sup>90</sup>Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major nuclear steam supply system components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.<sup>[28]</sup> Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the Turkey Point components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from NUREG/CR-0130<sup>[29]</sup> and NUREG/CR-0672,<sup>[30]</sup> and benchmarked to the long-lived values from NUREG/CR-3474.

The control elements are disposed of along with the spent fuel, i.e., there is no additional cost provided for their disposal.

This study assumes that contamination (activation) of the containment building structure is confined to the biological shield.

### Contaminated Soil

The estimates include an allowance for the removal of contaminated soil from past construction projects (approximately 3,140 cubic yards). In addition (approximately 1,550 cubic yards) of contaminated soil previously approved by the NRC to be retained in place until decommissioning pursuant to 10CFR20.302 is included. Also included is (approximately 530 cubic yards) of contaminated soil from the RPV head replacement project. This total of 140,940 cubic feet is included in the LLW Storage Area Soil Disposal line item equally distributed between both units.

Remediation and disposal of 59,300 cubic feet of contaminated soil/grass like material is also included.

### Asbestos and Hazardous Waste

The estimates include an allowance for the remediation of asbestos insulation and fire retardant material at Units 3 and 4 and disposal of mixed/hazardous waste left over from plant operations.

## 3.6.4 General

### Transition Activities

Existing warehouses are cleared of non-essential material and remain for use by FPL and its subcontractors. The warehouses are removed once they are no longer needed. The plant's operating staff performs the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.
- Process operating waste inventories. Disposal of operating wastes (e.g., filtration media, resins) during this initial period is not considered a decommissioning expense. The estimates do not address the disposition of any legacy or retired components (except for the highly-activated material currently stored in the spent fuel pool and some mixed/hazardous wastes).

### Scrap and Salvage

The existing plant equipment is considered obsolete and suitable for scrap as deadweight quantities only. FPL will make economically reasonable efforts to salvage equipment following final plant shutdown. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the value that an owner may realize based upon those efforts.

It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be more than offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimates do not include the additional cost for size reduction and preparation to meet “furnace ready” conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation, an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property is removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts are also made available for alternative use.

### Energy

For estimating purposes, the plant is assumed to be de-energized, with the exception of those facilities associated with spent fuel storage. Replacement power costs are used to calculate the cost of energy consumed during decommissioning for tooling, lighting, ventilation, and essential services.

### Emergency Planning

FEMA fees associated with emergency planning are assumed to continue for approximately 18 months following the cessation of operations. At this time, the fees are discontinued. The timing is based upon the anticipated condition of the spent fuel (i.e., the hottest spent fuel assemblies are assumed to be cool enough that no substantial Zircaloy oxidation and off-site event would occur with the loss of spent fuel pool water). State and local fees continue until all fuel has been removed from site.

### Insurance

Costs for continuing coverage (nuclear liability and property insurance) following cessation of plant operations and during decommissioning are included and based upon current operating premiums. Reductions in premiums, throughout the decommissioning process, are based upon the guidance provided in SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning."<sup>[31]</sup> The NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

### Taxes

Property taxes are included within the estimates. However, the tax is based upon the land, without any consideration of any ongoing site operations and property assets. The provided land values are applicable throughout decommissioning.

### Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

### Site Restoration

The Intake and Discharge canals remain in place. Circulating water structures are removed and the canal bank restored. Structures to be removed include but are not limited to the containment, fuel handling, auxiliary, control, radwaste solidification, and turbine buildings.

### **3.7 COST ESTIMATE SUMMARY**

Schedules of expenditures are provided in Tables 3.1 through 3.4. The tables delineate the cost contributors by year of expenditures as well as cost contributor (e.g., labor, materials, and waste disposal).

The tables in Appendices C and D provide additional detail. The cost elements in these tables are assigned to one of three subcategories: “License Termination,” “Spent Fuel Management,” and “Site Restoration.” The subcategory “License Termination” is used to accumulate costs that are consistent with “decommissioning” as defined by the NRC in its financial assurance regulations (i.e., 10 CFR §50.75). The cost reported for this subcategory is generally sufficient to terminate the plant’s operating license, recognizing that there may be some additional cost impact from spent fuel management. The License Termination cost subcategory also includes costs to decommission the ISFSI (as required by 10 CFR §72.30). The basis for the ISFSI decommissioning cost that is included in Appendices C and D is provided in Appendix E.

The “Spent Fuel Management” subcategory contains costs associated with the containerization and transfer of spent fuel from the wet storage pools to the DOE and/or ISFSI for interim storage, as well as the transfer of the spent fuel in storage at the ISFSI to the DOE. Costs are included for the operation of the storage pools and the management of the ISFSI until such time that the transfer is complete. It does not include any spent fuel management expenses incurred prior to the cessation of plant operations, nor does it include any cost related to the final disposal of the spent fuel. Under the terms of the settlement agreement with the DOE, there are activities and costs identified in the decommissioning cost study that are expected to be eligible for reimbursement (depending upon the timing of the activities).

“Site Restoration” is used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet and backfilled to conform to local grade.

As discussed in Section 3.5.1, it is assumed that the DOE will not accept the GTCC waste prior to completing the transfer of spent fuel. Therefore, the cost of GTCC disposal is shown in the final year of ISFSI operation (for the DECON alternative). While designated for disposal at the federal facility along with the spent fuel, GTCC waste is still classified as low-level radioactive waste and, as such, included as a “License Termination” expense.

Decommissioning costs are reported in 2015 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure (or projected lifetime of the plant). The schedules are based upon the detailed activity costs reported in Appendices C and D, along with the timelines presented in Section 4.

The “Burial” column contains costs for the processing of low-level radioactive waste, as well as for the controlled disposal of material that cannot be recovered (released for unrestricted use). Since the following tables are often used in escalation analyses, costs associated with the disposition of GTCC have been reassigned to the “Other” column, commensurate with contractual payments for a one-time disposal service, although the cost is still reported in the “LLRW Disposal Costs” column in Appendices C and D and as a “Waste Disposal” cost in the summary tables (i.e., on pages xix, xx, 6-4 and 6-5). “Off-site Waste Processing,” separately reported in the summary tables, has been included in the “Burial” column as well.

**TABLE 3.1  
TURKEY POINT NUCLEAR PLANT, UNIT 3  
DECON ALTERNATIVE  
SCHEDULE OF TOTAL ANNUAL EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032	28,412	2,135	1,527	20	3,882	35,975
2033	73,622	14,646	4,886	9,666	20,217	123,037
2034	68,433	27,016	3,374	27,889	18,114	144,826
2035	56,613	24,006	2,874	17,835	13,732	115,060
2036	44,616	20,657	2,526	6,159	9,834	83,791
2037	44,494	20,601	2,519	6,142	9,807	83,562
2038	18,133	4,396	843	3,071	6,008	32,452
2039	15,851	1,603	410	20	4,191	22,076
2040	15,457	6,423	386	4	1,617	23,887
2041	14,070	7,122	336	0	1,152	22,680
2042	3,261	884	17	0	1,151	5,313
2043	2,701	560	0	0	1,151	4,412
2044	2,708	561	0	0	1,154	4,424
2045	2,701	560	0	0	1,151	4,412
2046	2,701	560	0	0	1,151	4,412
2047	2,701	560	0	0	1,151	4,412
2048	2,708	561	0	0	1,154	4,424
2049	2,701	560	0	0	1,151	4,412
2050	2,701	560	0	0	1,151	4,412
2051	2,701	560	0	0	1,151	4,412
2052	2,708	561	0	0	1,154	4,424
2053	2,701	560	0	0	1,151	4,412
2054	2,701	560	0	0	1,151	4,412
2055	2,701	560	0	0	1,151	4,412
2056	2,708	561	0	0	1,154	4,424
2057	2,701	560	0	0	1,151	4,412
2058	2,701	560	0	0	1,151	4,412
2059	2,701	560	0	0	1,151	4,412
2060	2,708	561	0	0	1,154	4,424
2061	2,701	560	0	0	1,151	4,412
2062	2,701	560	0	0	1,151	4,412

**TABLE 3.1 (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2063	2,701	560	0	0	1,151	4,412
2064	2,708	561	0	0	1,154	4,424
2065	2,701	560	0	0	1,151	4,412
2066	2,701	560	0	0	1,151	4,412
2067	2,701	560	0	0	1,151	4,412
2068	2,708	561	0	0	1,154	4,424
2069	2,701	560	0	0	1,151	4,412
2070	2,701	560	0	0	1,151	4,412
2071	2,701	560	0	0	1,151	4,412
2072	2,701	1,767	0	0	16,142	20,610
2073	788	717	177	907	2,145	4,734
<b>Total</b>	<b>464,827</b>	<b>148,222</b>	<b>19,874</b>	<b>71,714</b>	<b>141,397</b>	<b>846,034</b>

**TABLE 3.1a**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**DECON ALTERNATIVE**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032	27,693	881	1,527	20	3,105	33,227
2033	71,308	11,240	4,886	9,666	18,510	115,609
2034	64,297	22,378	3,374	27,889	16,623	134,561
2035	51,943	14,261	2,874	17,835	12,253	99,166
2036	39,389	5,167	2,526	6,159	8,352	61,592
2037	39,281	5,153	2,519	6,142	8,329	61,424
2038	17,819	3,461	843	3,071	5,407	30,601
2039	15,523	618	410	20	3,630	20,201
2040	3,436	139	98	4	548	4,225
2041	120	0	0	0	0	120
2042	6	0	0	0	0	6
2043 -71	0	0	0	0	0	0
2072	0	1,227	0	0	14,987	16,214
2073	502	198	121	907	2,110	3,838
<b>Total</b>	<b>331,315</b>	<b>64,721</b>	<b>19,178</b>	<b>71,714</b>	<b>93,856</b>	<b>580,783</b>

**TABLE 3.1b  
TURKEY POINT NUCLEAR PLANT, UNIT 3  
DECON ALTERNATIVE  
SPENT FUEL MANAGEMENT EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032	418	1,254	0	0	776	2,448
2033	1,135	3,406	0	0	1,707	6,248
2034	1,509	4,528	0	0	1,489	7,527
2035	3,227	9,682	0	0	1,478	14,387
2036	5,162	15,487	0	0	1,482	22,130
2037	5,148	15,444	0	0	1,478	22,070
2038	312	936	0	0	601	1,848
2039	329	986	0	0	561	1,875
2040	2,441	907	0	0	1,067	4,415
2041	2,778	853	0	0	1,150	4,780
2042	2,705	574	0	0	1,151	4,430
2043	2,701	560	0	0	1,151	4,412
2044	2,708	561	0	0	1,154	4,424
2045	2,701	560	0	0	1,151	4,412
2046	2,701	560	0	0	1,151	4,412
2047	2,701	560	0	0	1,151	4,412
2048	2,708	561	0	0	1,154	4,424
2049	2,701	560	0	0	1,151	4,412
2050	2,701	560	0	0	1,151	4,412
2051	2,701	560	0	0	1,151	4,412
2052	2,708	561	0	0	1,154	4,424
2053	2,701	560	0	0	1,151	4,412
2054	2,701	560	0	0	1,151	4,412
2055	2,701	560	0	0	1,151	4,412
2056	2,708	561	0	0	1,154	4,424
2057	2,701	560	0	0	1,151	4,412
2058	2,701	560	0	0	1,151	4,412
2059	2,701	560	0	0	1,151	4,412
2060	2,708	561	0	0	1,154	4,424
2061	2,701	560	0	0	1,151	4,412
2062	2,701	560	0	0	1,151	4,412

**TABLE 3.1b (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**DECON ALTERNATIVE**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2063	2,701	560	0	0	1,151	4,412
2064	2,708	561	0	0	1,154	4,424
2065	2,701	560	0	0	1,151	4,412
2066	2,701	560	0	0	1,151	4,412
2067	2,701	560	0	0	1,151	4,412
2068	2,708	561	0	0	1,154	4,424
2069	2,701	560	0	0	1,151	4,412
2070	2,701	560	0	0	1,151	4,412
2071	2,701	560	0	0	1,151	4,412
2072	2,701	540	0	0	1,155	4,396
2073	0	0	0	0	0	0
Total	106,241	70,846	0	0	47,499	224,586

**TABLE 3.1c**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**DECON ALTERNATIVE**  
**SITE RESTORATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032	300	0	0	0	0	300
2033	1,180	0	0	0	0	1,180
2034	2,627	109	0	0	2	2,738
2035	1,443	63	0	0	1	1,507
2036	65	4	0	0	0	69
2037	65	4	0	0	0	69
2038	3	0	0	0	0	3
2039	0	0	0	0	0	0
2040	9,581	5,376	288	0	2	15,247
2041	11,172	6,270	336	0	2	17,780
2042	551	309	17	0	0	877
2043-72	0	0	0	0	0	0
2073	286	520	56	0	35	897
Total	27,272	12,655	697	0	42	40,665

**TABLE 3.2  
TURKEY POINT NUCLEAR PLANT, UNIT 4  
DECON ALTERNATIVE  
SCHEDULE OF TOTAL ANNUAL EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033	39,827	2,120	2,448	32	5,709	50,135
2034	58,461	11,951	5,574	12,532	16,852	105,370
2035	71,208	21,823	3,191	26,959	16,684	139,864
2036	68,713	25,459	2,886	18,839	13,948	129,845
2037	65,432	29,501	2,519	9,368	10,712	117,531
2038	60,958	30,083	2,248	8,524	9,881	111,695
2039	33,230	14,419	933	2,236	5,281	56,099
2040	17,608	7,980	386	4	1,759	27,737
2041	16,283	8,763	336	0	1,353	26,735
2042	3,445	1,187	17	0	1,160	5,808
2043	2,779	794	0	0	1,150	4,723
2044	2,786	796	0	0	1,154	4,736
2045	2,779	794	0	0	1,150	4,723
2046	2,779	794	0	0	1,150	4,723
2047	2,779	794	0	0	1,150	4,723
2048	2,786	796	0	0	1,154	4,736
2049	2,779	794	0	0	1,150	4,723
2050	2,779	794	0	0	1,150	4,723
2051	2,779	794	0	0	1,150	4,723
2052	2,786	796	0	0	1,154	4,736
2053	2,779	794	0	0	1,150	4,723
2054	2,779	794	0	0	1,150	4,723
2055	2,779	794	0	0	1,150	4,723
2056	2,786	796	0	0	1,154	4,736
2057	2,779	794	0	0	1,150	4,723
2058	2,779	794	0	0	1,150	4,723
2059	2,779	794	0	0	1,150	4,723
2060	2,786	796	0	0	1,154	4,736
2061	2,779	794	0	0	1,150	4,723
2062	2,779	794	0	0	1,150	4,723
2063	2,779	794	0	0	1,150	4,723

**TABLE 3.2 (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**DECON ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2064	2,786	796	0	0	1,154	4,736
2065	2,779	794	0	0	1,150	4,723
2066	2,779	794	0	0	1,150	4,723
2067	2,779	794	0	0	1,150	4,723
2068	2,786	796	0	0	1,154	4,736
2069	2,779	794	0	0	1,150	4,723
2070	2,779	794	0	0	1,150	4,723
2071	2,779	794	0	0	1,150	4,723
2072	2,776	1,992	0	0	16,139	20,907
2073	788	717	177	907	2,145	4,734
<b>Total</b>	<b>519,363</b>	<b>179,029</b>	<b>20,714</b>	<b>79,402</b>	<b>135,007</b>	<b>933,515</b>

**TABLE 3.2a**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**DECON ALTERNATIVE**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033	39,385	1,411	2,448	32	4,465	47,740
2034	57,653	11,677	5,574	12,532	15,160	102,596
2035	67,380	21,664	3,191	26,959	15,205	134,398
2036	63,008	14,712	2,886	18,839	12,354	111,800
2037	57,597	6,611	2,519	9,368	8,993	85,087
2038	52,915	6,426	2,248	8,524	8,429	78,542
2039	29,389	2,896	933	2,236	4,720	40,174
2040	3,584	151	98	4	517	4,354
2041	51	0	0	0	0	51
2042	3	0	0	0	0	3
2043-71	0	0	0	0	0	0
2072	0	1,227	0	0	14,987	16,214
2073	502	198	121	907	2,110	3,838
<b>Total</b>	<b>371,466</b>	<b>66,973</b>	<b>20,017</b>	<b>79,402</b>	<b>86,940</b>	<b>624,798</b>

**TABLE 3.2b**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**DECON ALTERNATIVE**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033	236	709	0	0	1,244	2,189
2034	88	264	0	0	1,692	2,044
2035	0	0	0	0	1,478	1,478
2036	3,529	10,588	0	0	1,482	15,599
2037	7,578	22,734	0	0	1,478	31,789
2038	7,845	23,536	0	0	1,266	32,648
2039	3,841	11,523	0	0	561	15,924
2040	2,252	341	0	0	909	3,502
2041	2,504	31	0	0	965	3,500
2042	2,765	756	0	0	1,141	4,663
2043	2,779	794	0	0	1,150	4,723
2044	2,786	796	0	0	1,154	4,736
2045	2,779	794	0	0	1,150	4,723
2046	2,779	794	0	0	1,150	4,723
2047	2,779	794	0	0	1,150	4,723
2048	2,786	796	0	0	1,154	4,736
2049	2,779	794	0	0	1,150	4,723
2050	2,779	794	0	0	1,150	4,723
2051	2,779	794	0	0	1,150	4,723
2052	2,786	796	0	0	1,154	4,736
2053	2,779	794	0	0	1,150	4,723
2054	2,779	794	0	0	1,150	4,723
2055	2,779	794	0	0	1,150	4,723
2056	2,786	796	0	0	1,154	4,736
2057	2,779	794	0	0	1,150	4,723
2058	2,779	794	0	0	1,150	4,723
2059	2,779	794	0	0	1,150	4,723
2060	2,786	796	0	0	1,154	4,736
2061	2,779	794	0	0	1,150	4,723
2062	2,779	794	0	0	1,150	4,723
2063	2,779	794	0	0	1,150	4,723

**TABLE 3.2b (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**DECON ALTERNATIVE**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2064	2,786	796	0	0	1,154	4,736
2065	2,779	794	0	0	1,150	4,723
2066	2,779	794	0	0	1,150	4,723
2067	2,779	794	0	0	1,150	4,723
2068	2,786	796	0	0	1,154	4,736
2069	2,779	794	0	0	1,150	4,723
2070	2,779	794	0	0	1,150	4,723
2071	2,779	794	0	0	1,150	4,723
2072	2,776	765	0	0	1,151	4,693
2073	0	0	0	0	0	0
<b>Total</b>	<b>114,052</b>	<b>94,281</b>	<b>0</b>	<b>0</b>	<b>46,751</b>	<b>255,084</b>

**TABLE 3.2c**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**DECON ALTERNATIVE**  
**SITE RESTORATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033	206	0	0	0	0	206
2034	719	10	0	0	0	730
2035	3,827	159	0	0	2	3,988
2036	2,175	158	0	0	113	2,446
2037	257	157	0	0	241	655
2038	198	121	0	0	185	504
2039	0	0	0	0	0	0
2040	11,772	7,488	288	0	333	19,881
2041	13,728	8,732	336	0	388	23,184
2042	677	431	17	0	19	1,143
2043-72	0	0	0	0	0	0
2073	286	520	56	0	35	897
Total	33,845	17,775	697	0	1,316	53,633

**TABLE 3.3  
TURKEY POINT NUCLEAR PLANT, UNIT 3  
SAFSTOR ALTERNATIVE  
SCHEDULE OF TOTAL ANNUAL EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032	23,546	1,900	1,527	20	3,882	30,876
2033	54,257	9,298	3,358	6,462	19,115	92,490
2034	15,490	12,057	812	1,569	7,825	37,753
2035	12,924	11,741	672	13	4,918	30,268
2036	12,959	11,774	674	13	4,932	30,351
2037	12,924	11,741	672	13	4,918	30,268
2038	4,905	1,379	352	7	2,096	8,739
2039	4,489	841	336	7	1,950	7,623
2040	4,501	844	337	7	1,955	7,644
2041	4,489	841	336	7	1,950	7,623
2042	4,489	841	336	7	1,950	7,623
2043	4,489	841	336	7	1,950	7,623
2044	4,501	844	337	7	1,955	7,644
2045	4,489	841	336	7	1,950	7,623
2046	4,489	841	336	7	1,950	7,623
2047	4,489	841	336	7	1,950	7,623
2048	4,501	844	337	7	1,955	7,644
2049	4,489	841	336	7	1,950	7,623
2050	4,489	841	336	7	1,950	7,623
2051	4,489	841	336	7	1,950	7,623
2052	4,501	844	337	7	1,955	7,644
2053	4,489	841	336	7	1,950	7,623
2054	4,489	841	336	7	1,950	7,623
2055	4,489	841	336	7	1,950	7,623
2056	4,501	844	337	7	1,955	7,644
2057	4,489	841	336	7	1,950	7,623
2058	4,489	841	336	7	1,950	7,623
2059	4,489	841	336	7	1,950	7,623
2060	4,501	844	337	7	1,955	7,644
2061	4,489	841	336	7	1,950	7,623
2062	4,489	841	336	7	1,950	7,623

**TABLE 3.3 (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2063	4,489	841	336	7	1,950	7,623
2064	4,501	844	337	7	1,955	7,644
2065	4,489	841	336	7	1,950	7,623
2066	4,489	841	336	7	1,950	7,623
2067	4,489	841	336	7	1,950	7,623
2068	4,501	844	337	7	1,955	7,644
2069	4,489	841	336	7	1,950	7,623
2070	4,489	841	336	7	1,950	7,623
2071	4,489	841	336	7	1,950	7,623
2072	4,501	844	337	7	1,955	7,644
2073	1,959	255	336	6	1,366	3,922
2074	1,959	255	336	6	1,366	3,922
2075	1,959	255	336	6	1,366	3,922
2076	1,964	256	337	6	1,369	3,932
2077	1,959	255	336	6	1,366	3,922
2078	1,959	255	336	6	1,366	3,922
2079	1,959	255	336	6	1,366	3,922
2080	1,964	256	337	6	1,369	3,932
2081	1,959	255	336	6	1,366	3,922
2082	1,959	255	336	6	1,366	3,922
2083	1,959	255	336	6	1,366	3,922
2084	1,964	256	337	6	1,369	3,932
2085	27,365	3,049	2,108	23	2,639	35,184
2086	47,706	7,016	3,345	2,225	5,525	65,818
2087	53,034	22,826	3,191	27,562	28,554	135,166
2088	32,779	7,497	2,616	8,902	11,710	63,504
2089	29,545	5,104	2,519	5,989	9,070	52,227
2090	23,109	3,962	1,946	4,629	7,634	41,279
2091	5,277	261	138	11	2,831	8,519
2092	16,619	3,493	521	16	1,730	22,379

**TABLE 3.3 (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2093	11,390	6,525	336	0	35	18,286
2094	5,211	2,985	154	0	16	8,366
Total	565,304	154,296	40,400	57,754	200,173	1,017,926

**TABLE 3.3a**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**SAFSTOR ALTERNATIVE**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032	23,128	646	1,527	20	3,105	28,427
2033	53,121	5,892	3,358	6,462	17,408	86,243
2034	5,023	1,033	493	1,569	5,958	14,076
2035	1,959	341	336	13	3,042	5,691
2036	1,964	342	337	13	3,050	5,707
2037	1,959	341	336	13	3,042	5,691
2038	1,959	263	336	7	855	3,420
2039	1,959	259	336	7	742	3,302
2040	1,964	260	337	7	744	3,311
2041	1,959	259	336	7	742	3,302
2042	1,959	259	336	7	742	3,302
2043	1,959	259	336	7	742	3,302
2044	1,964	260	337	7	744	3,311
2045	1,959	259	336	7	742	3,302
2046	1,959	259	336	7	742	3,302
2047	1,959	259	336	7	742	3,302
2048	1,964	260	337	7	744	3,311
2049	1,959	259	336	7	742	3,302
2050	1,959	259	336	7	742	3,302
2051	1,959	259	336	7	742	3,302
2052	1,964	260	337	7	744	3,311
2053	1,959	259	336	7	742	3,302
2054	1,959	259	336	7	742	3,302
2055	1,959	259	336	7	742	3,302
2056	1,964	260	337	7	744	3,311
2057	1,959	259	336	7	742	3,302
2058	1,959	259	336	7	742	3,302
2059	1,959	259	336	7	742	3,302
2060	1,964	260	337	7	744	3,311
2061	1,959	259	336	7	742	3,302
2062	1,959	259	336	7	742	3,302

**TABLE 3.3a (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**SAFSTOR ALTERNATIVE**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2063	1,959	259	336	7	742	3,302
2064	1,964	260	337	7	744	3,311
2065	1,959	259	336	7	742	3,302
2066	1,959	259	336	7	742	3,302
2067	1,959	259	336	7	742	3,302
2068	1,964	260	337	7	744	3,311
2069	1,959	259	336	7	742	3,302
2070	1,959	259	336	7	742	3,302
2071	1,959	259	336	7	742	3,302
2072	1,964	260	337	7	744	3,311
2073	1,959	255	336	6	1,366	3,922
2074	1,959	255	336	6	1,366	3,922
2075	1,959	255	336	6	1,366	3,922
2076	1,964	256	337	6	1,369	3,932
2077	1,959	255	336	6	1,366	3,922
2078	1,959	255	336	6	1,366	3,922
2079	1,959	255	336	6	1,366	3,922
2080	1,964	256	337	6	1,369	3,932
2081	1,959	255	336	6	1,366	3,922
2082	1,959	255	336	6	1,366	3,922
2083	1,959	255	336	6	1,366	3,922
2084	1,964	256	337	6	1,369	3,932
2085	26,957	3,049	2,108	23	2,639	34,776
2086	46,248	7,005	3,345	2,225	5,525	64,348
2087	49,798	22,690	3,191	27,562	28,552	131,792
2088	32,285	7,476	2,616	8,902	11,710	62,988
2089	29,476	5,100	2,519	5,989	9,070	52,155
2090	23,056	3,959	1,946	4,629	7,634	41,224
2091	5,277	261	138	11	2,831	8,519
2092	11,493	526	368	16	1,714	14,116

**TABLE 3.3a (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**SAFSTOR ALTERNATIVE**  
**LICENSE TERMINATION EXPENDITURES**  
 (thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2093	119	0	0	0	0	119
2094	55	0	0	0	0	55
Total	404,043	70,797	38,414	57,754	147,770	718,777

**TABLE 3.3b**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**SAFSTOR ALTERNATIVE**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032	418	1,254	0	0	776	2,448
2033	1,135	3,406	0	0	1,707	6,248
2034	10,467	11,025	318	0	1,867	23,677
2035	10,965	11,400	336	0	1,876	24,577
2036	10,995	11,431	337	0	1,881	24,644
2037	10,965	11,400	336	0	1,876	24,577
2038	2,946	1,116	17	0	1,241	5,320
2039	2,530	582	0	0	1,208	4,321
2040	2,537	584	0	0	1,212	4,333
2041	2,530	582	0	0	1,208	4,321
2042	2,530	582	0	0	1,208	4,321
2043	2,530	582	0	0	1,208	4,321
2044	2,537	584	0	0	1,212	4,333
2045	2,530	582	0	0	1,208	4,321
2046	2,530	582	0	0	1,208	4,321
2047	2,530	582	0	0	1,208	4,321
2048	2,537	584	0	0	1,212	4,333
2049	2,530	582	0	0	1,208	4,321
2050	2,530	582	0	0	1,208	4,321
2051	2,530	582	0	0	1,208	4,321
2052	2,537	584	0	0	1,212	4,333
2053	2,530	582	0	0	1,208	4,321
2054	2,530	582	0	0	1,208	4,321
2055	2,530	582	0	0	1,208	4,321
2056	2,537	584	0	0	1,212	4,333
2057	2,530	582	0	0	1,208	4,321
2058	2,530	582	0	0	1,208	4,321
2059	2,530	582	0	0	1,208	4,321
2060	2,537	584	0	0	1,212	4,333
2061	2,530	582	0	0	1,208	4,321
2062	2,530	582	0	0	1,208	4,321

**TABLE 3.3b (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**SAFSTOR ALTERNATIVE**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2063	2,530	582	0	0	1,208	4,321
2064	2,537	584	0	0	1,212	4,333
2065	2,530	582	0	0	1,208	4,321
2066	2,530	582	0	0	1,208	4,321
2067	2,530	582	0	0	1,208	4,321
2068	2,537	584	0	0	1,212	4,333
2069	2,530	582	0	0	1,208	4,321
2070	2,530	582	0	0	1,208	4,321
2071	2,530	582	0	0	1,208	4,321
2072	2,537	584	0	0	1,212	4,333
2073-94	0	0	0	0	0	0
Total	133,989	70,846	1,343	0	52,334	258,513

**TABLE 3.3c**  
**TURKEY POINT NUCLEAR PLANT, UNIT 3**  
**SAFSTOR ALTERNATIVE**  
**SITE RESTORATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032-84	0	0	0	0	0	0
2085	408	0	0	0	0	408
2086	1,459	11	0	0	0	1,469
2087	3,236	137	0	0	2	3,374
2088	494	22	0	0	0	516
2089	68	4	0	0	0	72
2090	53	3	0	0	0	56
2091	0	0	0	0	0	0
2092	5,126	2,967	153	0	16	8,262
2093	11,271	6,525	336	0	35	18,167
2094	5,157	2,985	154	0	16	8,312
Total	27,272	12,653	642	0	69	40,637

**TABLE 3.4  
TURKEY POINT NUCLEAR PLANT, UNIT 4  
SAFSTOR ALTERNATIVE  
SCHEDULE OF TOTAL ANNUAL EXPENDITURES  
(thousands, 2015 dollars)**

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033	28,660	1,723	2,448	30	5,709	38,569
2034	42,153	9,906	2,762	8,046	16,237	79,105
2035	17,100	13,172	672	15	4,959	35,918
2036	17,147	13,208	674	15	4,973	36,016
2037	17,100	13,172	672	15	4,959	35,918
2038	14,325	10,551	596	13	4,280	29,765
2039	4,749	1,503	336	7	1,937	8,532
2040	4,762	1,508	337	7	1,943	8,555
2041	4,749	1,503	336	7	1,937	8,532
2042	4,749	1,503	336	7	1,937	8,532
2043	4,749	1,503	336	7	1,937	8,532
2044	4,762	1,508	337	7	1,943	8,555
2045	4,749	1,503	336	7	1,937	8,532
2046	4,749	1,503	336	7	1,937	8,532
2047	4,749	1,503	336	7	1,937	8,532
2048	4,762	1,508	337	7	1,943	8,555
2049	4,749	1,503	336	7	1,937	8,532
2050	4,749	1,503	336	7	1,937	8,532
2051	4,749	1,503	336	7	1,937	8,532
2052	4,762	1,508	337	7	1,943	8,555
2053	4,749	1,503	336	7	1,937	8,532
2054	4,749	1,503	336	7	1,937	8,532
2055	4,749	1,503	336	7	1,937	8,532
2056	4,762	1,508	337	7	1,943	8,555
2057	4,749	1,503	336	7	1,937	8,532
2058	4,749	1,503	336	7	1,937	8,532
2059	4,749	1,503	336	7	1,937	8,532
2060	4,762	1,508	337	7	1,943	8,555
2061	4,749	1,503	336	7	1,937	8,532
2062	4,749	1,503	336	7	1,937	8,532
2063	4,749	1,503	336	7	1,937	8,532

**TABLE 3.4 (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2064	4,762	1,508	337	7	1,943	8,555
2065	4,749	1,503	336	7	1,937	8,532
2066	4,749	1,503	336	7	1,937	8,532
2067	4,749	1,503	336	7	1,937	8,532
2068	4,762	1,508	337	7	1,943	8,555
2069	4,749	1,503	336	7	1,937	8,532
2070	4,749	1,503	336	7	1,937	8,532
2071	4,749	1,503	336	7	1,937	8,532
2072	4,762	1,508	337	7	1,943	8,555
2073	1,969	270	336	6	1,367	3,947
2074	1,969	270	336	6	1,367	3,947
2075	1,969	270	336	6	1,367	3,947
2076	1,974	270	337	6	1,370	3,958
2077	1,969	270	336	6	1,367	3,947
2078	1,969	270	336	6	1,367	3,947
2079	1,969	270	336	6	1,367	3,947
2080	1,974	270	337	6	1,370	3,958
2081	1,969	270	336	6	1,367	3,947
2082	1,969	270	336	6	1,367	3,947
2083	1,969	270	336	6	1,367	3,947
2084	1,974	270	337	6	1,370	3,958
2085	1,969	270	336	6	1,367	3,947
2086	18,157	1,912	2,042	21	2,564	24,696
2087	33,952	5,835	3,349	1,670	4,922	49,729
2088	57,959	23,469	3,199	28,542	28,489	141,658
2089	45,616	8,840	2,624	11,021	12,315	80,416
2090	43,361	6,144	2,519	7,793	9,336	69,154
2091	39,035	5,096	2,139	6,198	8,017	60,484
2092	18,531	4,655	521	16	1,704	25,426
2093	13,870	8,980	336	0	236	23,422

**TABLE 3.4 (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**SAFSTOR ALTERNATIVE**  
**SCHEDULE OF TOTAL ANNUAL EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2094	6,346	4,109	154	0	108	10,716
Total	600,509	185,431	40,501	63,700	192,500	1,082,641

**TABLE 3.4a**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**SAFSTOR ALTERNATIVE**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033	28,423	1,014	2,448	30	4,465	36,379
2034	38,708	6,803	2,688	8,046	14,480	70,724
2035	1,969	376	336	15	3,026	5,722
2036	1,975	377	337	15	3,034	5,738
2037	1,969	376	336	15	3,026	5,722
2038	1,969	353	336	13	2,510	5,181
2039	1,969	274	336	7	729	3,314
2040	1,974	274	337	7	731	3,323
2041	1,969	274	336	7	729	3,314
2042	1,969	274	336	7	729	3,314
2043	1,969	274	336	7	729	3,314
2044	1,974	274	337	7	731	3,323
2045	1,969	274	336	7	729	3,314
2046	1,969	274	336	7	729	3,314
2047	1,969	274	336	7	729	3,314
2048	1,974	274	337	7	731	3,323
2049	1,969	274	336	7	729	3,314
2050	1,969	274	336	7	729	3,314
2051	1,969	274	336	7	729	3,314
2052	1,974	274	337	7	731	3,323
2053	1,969	274	336	7	729	3,314
2054	1,969	274	336	7	729	3,314
2055	1,969	274	336	7	729	3,314
2056	1,974	274	337	7	731	3,323
2057	1,969	274	336	7	729	3,314
2058	1,969	274	336	7	729	3,314
2059	1,969	274	336	7	729	3,314
2060	1,974	274	337	7	731	3,323
2061	1,969	274	336	7	729	3,314
2062	1,969	274	336	7	729	3,314
2063	1,969	274	336	7	729	3,314

**TABLE 3.4a (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**SAFSTOR ALTERNATIVE**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2064	1,974	274	337	7	731	3,323
2065	1,969	274	336	7	729	3,314
2066	1,969	274	336	7	729	3,314
2067	1,969	274	336	7	729	3,314
2068	1,974	274	337	7	731	3,323
2069	1,969	274	336	7	729	3,314
2070	1,969	274	336	7	729	3,314
2071	1,969	274	336	7	729	3,314
2072	1,974	274	337	7	731	3,323
2073	1,969	270	336	6	1,367	3,947
2074	1,969	270	336	6	1,367	3,947
2075	1,969	270	336	6	1,367	3,947
2076	1,974	270	337	6	1,370	3,958
2077	1,969	270	336	6	1,367	3,947
2078	1,969	270	336	6	1,367	3,947
2079	1,969	270	336	6	1,367	3,947
2080	1,974	270	337	6	1,370	3,958
2081	1,969	270	336	6	1,367	3,947
2082	1,969	270	336	6	1,367	3,947
2083	1,969	270	336	6	1,367	3,947
2084	1,974	270	337	6	1,370	3,958
2085	1,969	270	336	6	1,367	3,947
2086	17,989	1,912	2,042	21	2,564	24,528
2087	33,160	5,824	3,349	1,670	4,922	48,925
2088	53,221	23,276	3,199	28,542	28,487	136,726
2089	44,570	8,693	2,624	11,021	12,143	79,051
2090	42,997	6,006	2,519	7,793	9,132	68,447
2091	38,745	4,986	2,139	6,198	7,854	59,923
2092	12,247	571	368	16	1,596	14,797
2093	51	0	0	0	0	51

**TABLE 3.4a (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**SAFSTOR ALTERNATIVE**  
**LICENSE TERMINATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2094	23	0	0	0	0	23
Total	410,627	73,379	38,515	63,700	139,826	726,047

**TABLE 3.4b**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**SAFSTOR ALTERNATIVE**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033	236	709	0	0	1,244	2,189
2034	3,446	3,104	75	0	1,757	8,381
2035	15,131	12,796	336	0	1,933	30,196
2036	15,172	12,832	337	0	1,938	30,279
2037	15,131	12,796	336	0	1,933	30,196
2038	12,356	10,198	260	0	1,770	24,584
2039	2,780	1,230	0	0	1,208	5,218
2040	2,788	1,233	0	0	1,212	5,232
2041	2,780	1,230	0	0	1,208	5,218
2042	2,780	1,230	0	0	1,208	5,218
2043	2,780	1,230	0	0	1,208	5,218
2044	2,788	1,233	0	0	1,212	5,232
2045	2,780	1,230	0	0	1,208	5,218
2046	2,780	1,230	0	0	1,208	5,218
2047	2,780	1,230	0	0	1,208	5,218
2048	2,788	1,233	0	0	1,212	5,232
2049	2,780	1,230	0	0	1,208	5,218
2050	2,780	1,230	0	0	1,208	5,218
2051	2,780	1,230	0	0	1,208	5,218
2052	2,788	1,233	0	0	1,212	5,232
2053	2,780	1,230	0	0	1,208	5,218
2054	2,780	1,230	0	0	1,208	5,218
2055	2,780	1,230	0	0	1,208	5,218
2056	2,788	1,233	0	0	1,212	5,232
2057	2,780	1,230	0	0	1,208	5,218
2058	2,780	1,230	0	0	1,208	5,218
2059	2,780	1,230	0	0	1,208	5,218
2060	2,788	1,233	0	0	1,212	5,232
2061	2,780	1,230	0	0	1,208	5,218
2062	2,780	1,230	0	0	1,208	5,218
2063	2,780	1,230	0	0	1,208	5,218

**TABLE 3.4b (continued)**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**SAFSTOR ALTERNATIVE**  
**SPENT FUEL MANAGEMENT EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2064	2,788	1,233	0	0	1,212	5,232
2065	2,780	1,230	0	0	1,208	5,218
2066	2,780	1,230	0	0	1,208	5,218
2067	2,780	1,230	0	0	1,208	5,218
2068	2,788	1,233	0	0	1,212	5,232
2069	2,780	1,230	0	0	1,208	5,218
2070	2,780	1,230	0	0	1,208	5,218
2071	2,780	1,230	0	0	1,208	5,218
2072	2,788	1,233	0	0	1,212	5,232
2073-94	0	0	0	0	0	0
<b>Total</b>	<b>156,057</b>	<b>94,281</b>	<b>1,343</b>	<b>0</b>	<b>51,683</b>	<b>303,364</b>

**TABLE 3.4c**  
**TURKEY POINT NUCLEAR PLANT, UNIT 4**  
**SAFSTOR ALTERNATIVE**  
**SITE RESTORATION EXPENDITURES**  
(thousands, 2015 dollars)

Year	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033-85	0	0	0	0	0	0
2086	168	0	0	0	0	168
2087	793	11	0	0	0	804
2088	4,738	192	0	0	2	4,932
2089	1,045	147	0	0	172	1,365
2090	364	139	0	0	204	707
2091	290	110	0	0	162	562
2092	6,285	4,084	153	0	107	10,629
2093	13,819	8,980	336	0	236	23,371
2094	6,323	4,109	154	0	108	10,693
Total	33,825	17,771	642	0	991	53,230

### **3.8 COST RECOVERY**

As discussed earlier, FPL filed a lawsuit in 2004 claiming damages for DOE's failure to perform as originally prescribed in the standard disposal contract.

On March 31, 2009, FPL executed a Settlement Agreement with the DOE and the Department of Justice (DoJ). In the Agreement, FPL settled the lawsuit in exchange for payments. The payments are intended to cover those costs incurred for managing and storing the spent fuel that it would not have incurred but for DOE's delay in performance.

While the DOE is responsible for the costs incurred until it fulfills its obligation, certain assumptions are needed to assess the financial impact on the previously identified decommissioning cost scenarios. The assumptions and methodology employed to quantify the expected level of compensation are as follows:

1. DOE Acceptance Obligations are defined based on the 1995 Acceptance Priority Ranking & Annual Capacity Report Table 1 acceptance rate from Year 1 to Year 10, with a continued steady state acceptance rate of 900 metric tons of uranium (MTU) per year until December 31, 2014 and 2,100 MTU/year thereafter as per the Settlement Agreement.
2. At the time the aggregate MTUs actually accepted by the DOE equals the aggregate MTUs allocated to FPL under the 1995 Acceptance Priority Ranking & Annual Capacity Report, the DOE's compensation obligation ceases.
3. The pickup of commercial fuel is assumed to begin in the year 2030. The first fuel from Turkey Point is expected to be transferred to the DOE in 2031, again assuming commercial fuel is accepted on an oldest fuel first basis.\* The rate of transfer was based upon an annual acceptance capacity at the geologic repository of 3,000 metric tons.

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\* DOE's contracts with utilities order the acceptance of spent fuel from utilities based upon the oldest fuel receiving the highest priority. While DOE's acceptance priority ranking is based on the date that spent nuclear fuel was permanently discharged, with the oldest spent nuclear fuel, on an industry-wide basis, given the higher priority, the generator has the right to determine which spent nuclear fuel is delivered, provided that it is in compliance with the Standard Contract. DOE contracts also provide mechanisms for altering the oldest fuel first allocation scheme, including emergency deliveries, exchanges of allocations amongst utilities and the option of providing priority acceptance from permanently shut down nuclear reactors.

- The pickup schedule reflected in the 1995 Acceptance Priority Ranking & Annual Capacity Report is based upon an earlier start date (1998), but a lower rate of acceptance than that considered in the Turkey Point decommissioning analysis. As shown in Table 3.5, the two different pickup rates would achieve the same level of performance (equivalent number of Turkey Point spent fuel assemblies received by the DOE) in the year 2059 (approximately thirteen years before the ISFSI would be decommissioned). Under the terms of the Settlement Agreement, if the DOE follows the pickup rate, its compensation obligation would terminate when this milestone is reached. Under this scenario, the DOE would provide no compensation after 2059.
4. This analysis addresses only those costs identified as spent fuel management costs in the decommissioning cost analysis (as delineated in the detailed cost tables in Appendix C and D). While the estimates do assign costs to spent fuel management during the active decommissioning period, the cost elements are generally limited in scope to the direct costs associated with purchasing DSCs and HSMs, loading and packaging the spent fuel into the canisters for long-term storage at the plant's ISFSI (or into TADs for direct transfer to the DOE). No attempt was made, for this analysis, to identify any additional ISFSI related costs during this time period that may also be eligible for reimbursement by DOE under the Agreement.

As shown on the graph at the bottom of Table 3.5, it is projected that the DOE will meet its obligation for cumulative acceptance of spent fuel in the year 2059, based upon the assumptions delineated in the decommissioning cost analysis. Costs incurred for spent fuel management prior to this time (conservatively, December 31, 2058) can be expected to be reimbursed. Costs incurred after that time would not be eligible. Each year, the claim requesting the prior year's costs is submitted for payment on or before April 30.

The activities (at a minimum), identified in the decommissioning cost study and expected to be eligible for reimbursement (depending upon the timing of the activities) are identified below.

- I. Active Decommissioning (until the Operating Licenses are terminated)
  - Spent Fuel Capital and Transfer
  - ISFSI Operating Costs
  - Emergency Planning Fees (once the spent fuel pool is emptied)

II. Site Restoration (with concurrent ISFSI Operations)

- Spent Fuel Capital and Transfer
- Insurance
- Energy
- NRC ISFSI Fees
- Emergency Planning Fees
- ISFSI Operating Costs
- Security Staff (allocation)
- Plant Staff (allocation)

III. Post-Decommissioning ISFSI Operations

- Spent Fuel Transfer
- Insurance
- Property Taxes
- NRC ISFSI Fees
- Emergency Planning Fees
- ISFSI Operating Costs
- Security Staff
- Plant Staff

The costs eligible for reimbursement would still be incurred over the life of decommissioning project. However, they will be recovered on an ongoing basis (i.e., the year after expenditure). Tables 3.6 and 3.7 identify the income stream that can be expected to offset spent fuel management expenses for the decommissioning scenarios. Under the current assumptions, costs incurred in the year 2059 and beyond would not be eligible for reimbursement.

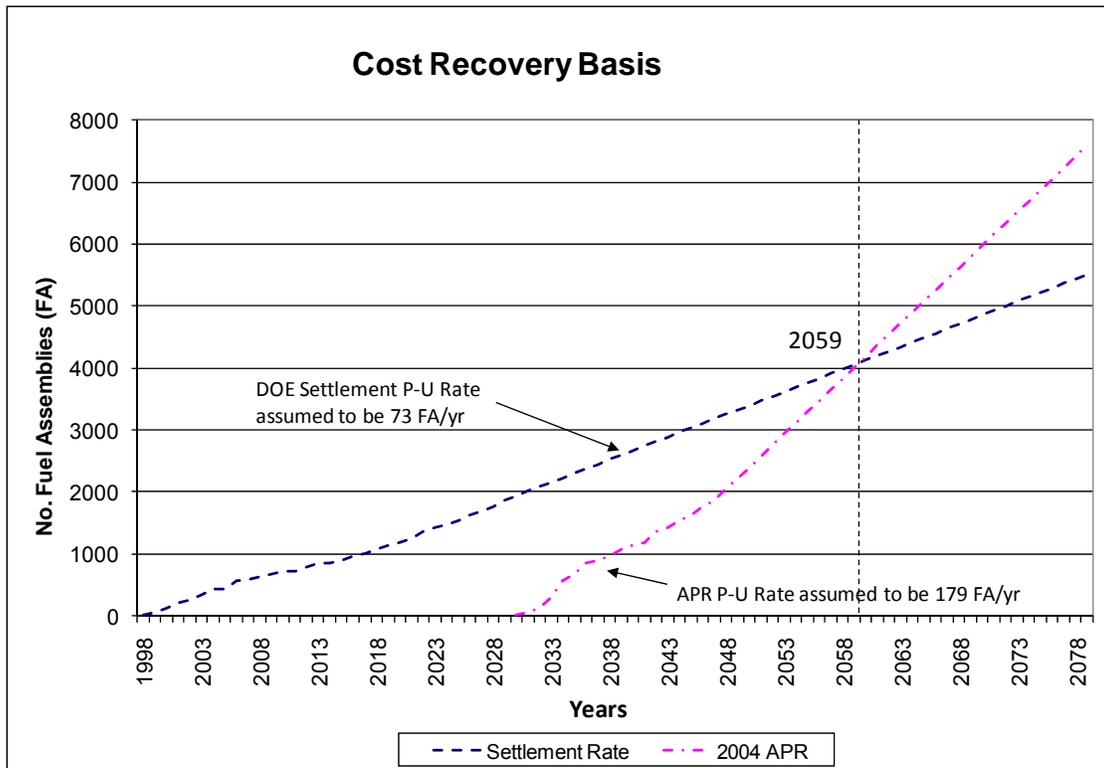
Table 3.8 identifies cost to decommission the ISFSI. While the costs are incurred after 2059, they may also be reimbursable since ISFSI construction was in response to delays in the timely removal of spent fuel from the site.

**TABLE 3.5  
TURKEY POINT NUCLEAR PLANT  
SPENT FUEL MANAGEMENT**

Year	Fuel Assembly Inventory		Spent Fuel Acceptance	
	Assemblies in Pool	Assemblies at ISFSI	Turkey Point Projections (based upon 2004 APR)	DOE Obligations (based on 1995 APR and Settlement Agreement)
2030	2,351	1,920	-	1,935
2031	2,319	1,920	46	2,008
2032	2,480	1,920	128	2,081
2033	2,509	1,920	306	2,154
2034	2,381	1,920	552	2,227
2035	2,157	1,920	671	2,300
2036	1,997	1,920	843	2,373
2037	1,387	2,466	904	2,446
2038	0	3,789	957	2,519
2039		3,661	1,077	2,592
2040		3,629	1,134	2,665
2041		3,597	1,186	2,738
2042		3,501	1,349	2,811
2043		3,469	1,413	2,884
2044		3,341	1,528	2,957
2045		3,245	1,625	3,030
2046		3,149	1,750	3,103
2047		3,053	1,862	3,176
2048		2,957	2,041	3,249
2049		2,829	2,220	3,322
2050		2,701	2,399	3,395
2051		2,573	2,578	3,468
2052		2,445	2,757	3,541
2053		2,317	2,936	3,614
2054		2,189	3,115	3,687
2055		2,061	3,294	3,760
2056		1,933	3,473	3,833
2057		1,805	3,652	3,906
2058		1,677	3,831	3,979
2059		1,549	4,010	4,052
2060		1,451	4,189	4,125

**TABLE 3.5 (continued)**  
**TURKEY POINT NUCLEAR PLANT**  
**SPENT FUEL MANAGEMENT**

Year	Fuel Assembly Inventory		Spent Fuel Acceptance	
	Assemblies in Pool	Assemblies at ISFSI	Turkey Point Projections (based upon 2004 APR)	DOE Obligations (based on 1995 APR and Settlement Agreement)
2061	-	1,323	4,368	4,198
2062	-	1,195	4,547	4,271
2063	-	1,067	4,726	4,344
2064	-	939	4,905	4,417
2065	-	811	5,084	4,490
2066	-	683	5,263	4,563
2067	-	555	5,442	4,636
2068	-	427	5,621	4,709
2069	-	299	5,800	4,782
2070	-	171	5,979	4,855
2071	-	43	6,158	4,928
2072	-	0	6,337	5,001



**TABLE 3.6  
TURKEY POINT NUCLEAR PLANT, UNIT 3  
DECON ALTERNATIVE  
COSTS RECOVERED FOR SPENT FUEL MANAGEMENT  
(thousands, 2015 dollars)**

Year*	Labor	Equipment & Materials	Transport	Burial	Other	Total
2032						
2033	418	1,254	0	0	26	1,697
2034	1,135	3,406	0	0	56	4,597
2035	1,509	4,528	0	0	56	6,094
2036	3,227	9,682	0	0	56	12,966
2037	5,162	15,487	0	0	56	20,705
2038	5,148	15,444	0	0	56	20,649
2039	312	936	0	0	538	1,786
2040	329	986	0	0	561	1,875
2041	302	907	0	0	1,067	2,277
2042	284	853	0	0	1,150	2,287
2043	2,582	574	0	0	1,151	4,307
2044	2,701	560	0	0	1,151	4,412
2045	2,708	561	0	0	1,154	4,424
2046	2,701	560	0	0	1,151	4,412
2047	2,701	560	0	0	1,151	4,412
2048	2,701	560	0	0	1,151	4,412
2049	2,708	561	0	0	1,154	4,424
2050	2,701	560	0	0	1,151	4,412
2051	2,701	560	0	0	1,151	4,412
2052	2,701	560	0	0	1,151	4,412
2053	2,708	561	0	0	1,154	4,424
2054	2,701	560	0	0	1,151	4,412
2055	2,701	560	0	0	1,151	4,412
2056	2,701	560	0	0	1,151	4,412
2057	2,708	561	0	0	1,154	4,424
2058	2,701	560	0	0	1,151	4,412
2059	2,701	560	0	0	1,151	4,412
<b>Total</b>	<b>63,652</b>	<b>63,023</b>	<b>0</b>	<b>0</b>	<b>23,205</b>	<b>149,880</b>

\* Costs expended in prior year

**TABLE 3.7  
TURKEY POINT NUCLEAR PLANT, UNIT 4  
DECON ALTERNATIVE  
COSTS RECOVERED FOR SPENT FUEL MANAGEMENT  
(thousands, 2015 dollars)**

Year*	Labor	Equipment & Materials	Transport	Burial	Other	Total
2033						
2034	236	709	0	0	41	986
2035	88	264	0	0	56	408
2036	0	0	0	0	56	56
2037	3,529	10,588	0	0	56	14,174
2038	7,578	22,734	0	0	56	30,368
2039	5,834	17,502	0	0	172	23,508
2040	441	1,322	0	0	561	2,323
2041	114	341	0	0	909	1,364
2042	10	31	0	0	965	1,007
2043	2,642	756	0	0	1,141	4,540
2044	2,779	794	0	0	1,150	4,723
2045	2,786	796	0	0	1,154	4,736
2046	2,779	794	0	0	1,150	4,723
2047	2,779	794	0	0	1,150	4,723
2048	2,779	794	0	0	1,150	4,723
2049	2,786	796	0	0	1,154	4,736
2050	2,779	794	0	0	1,150	4,723
2051	2,779	794	0	0	1,150	4,723
2052	2,779	794	0	0	1,150	4,723
2053	2,786	796	0	0	1,154	4,736
2054	2,779	794	0	0	1,150	4,723
2055	2,779	794	0	0	1,150	4,723
2056	2,779	794	0	0	1,150	4,723
2057	2,786	796	0	0	1,154	4,736
2058	2,779	794	0	0	1,150	4,723
2059	2,779	794	0	0	1,150	4,723
<b>Total</b>	<b>64,963</b>	<b>66,956</b>	<b>0</b>	<b>0</b>	<b>22,434</b>	<b>154,353</b>

\* Costs expended in prior year

**TABLE 3.8  
TURKEY POINT NUCLEAR PLANT  
ISFSI DECOMMISSIONING  
COSTS RECOVERED FOR SPENT FUEL MANAGEMENT**  
(thousands, 2015 dollars)

Year <sup>[1]</sup>	Labor	Equipment & Materials	Transport	Burial	Other	Total <sup>[2]</sup>
2074						
2075	1,004	395	242	1,814	4,220	7,675
Total	1,004	395	242	1,814	4,220	7,675

- Notes: 1. Costs are expended in prior year
2. Costs are divided evenly between the units in the cost estimates and schedules of expenditure
3. Costs as found in Appendices C and D

## **4. SCHEDULE ESTIMATE**

The schedules for the decommissioning scenarios considered in this study follow the sequences presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plan described in Section 3.5.1.

A schedule or sequence of activities for the DECON alternative is presented in Figure 4.1. The schedule is also representative of the work activities identified in the delayed dismantling phase of SAFSTOR, absent any spent fuel constraints.

The scheduling sequence is based on the fuel being removed from the spent fuel pools within five and one half years. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project Professional 2010" computer software.<sup>[32]</sup>

### **4.1 SCHEDULE ESTIMATE ASSUMPTIONS**

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual man-hour estimates from the cost table, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the DECON decommissioning schedule:

- The fuel handling area is isolated until such time that all spent fuel has been discharged from the spent fuel pools to the DOE or to the ISFSI. Decontamination and dismantling of the storage pools are initiated once the transfer of spent fuel to the ISFSI or DOE is complete.
- All work (except reactor vessel and reactor vessel internals removal and the spent fuel storage campaigns) is performed during an 8-hour workday, 5 days per week, with no overtime.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal

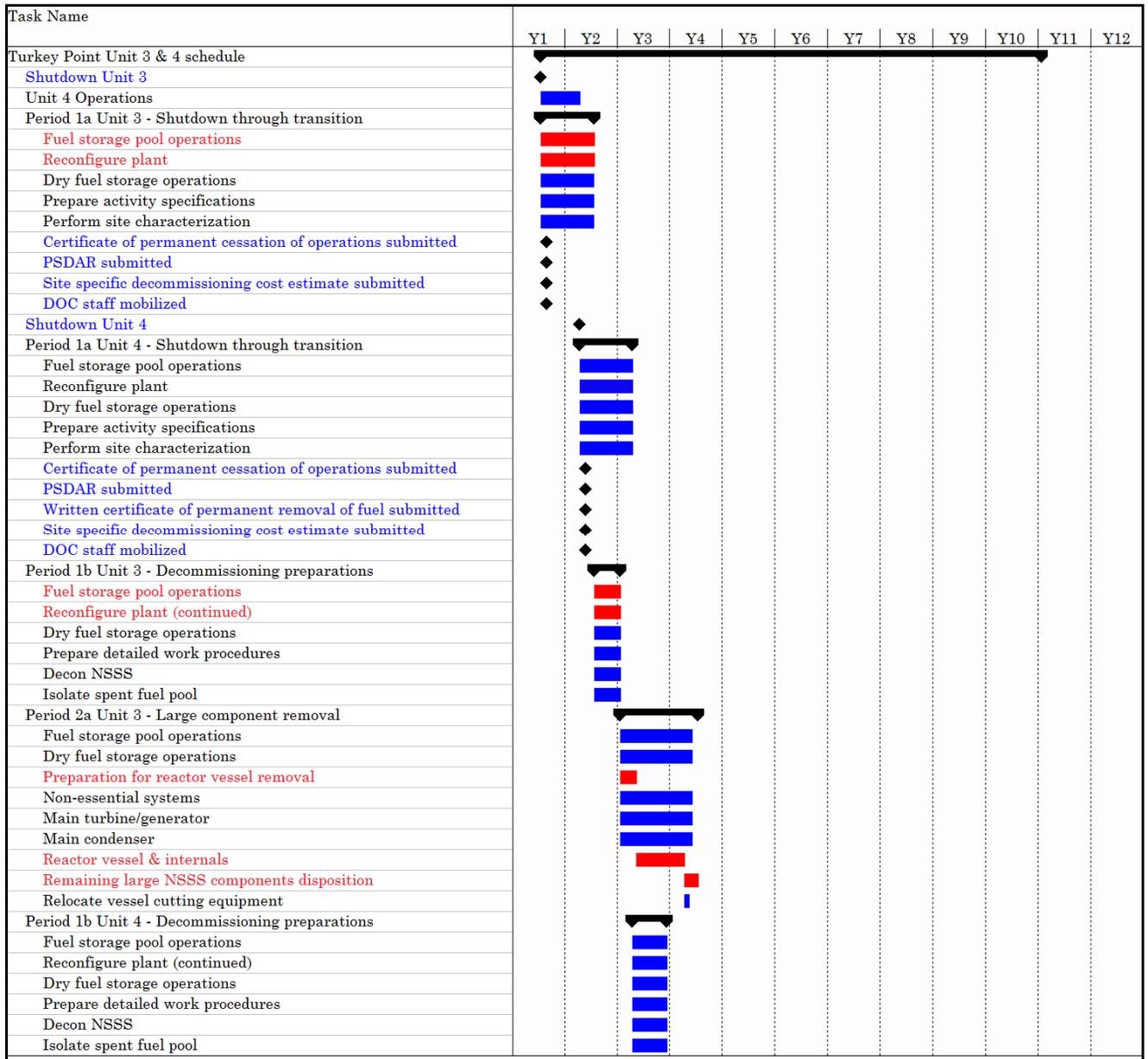
and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.

## **4.2 PROJECT SCHEDULE**

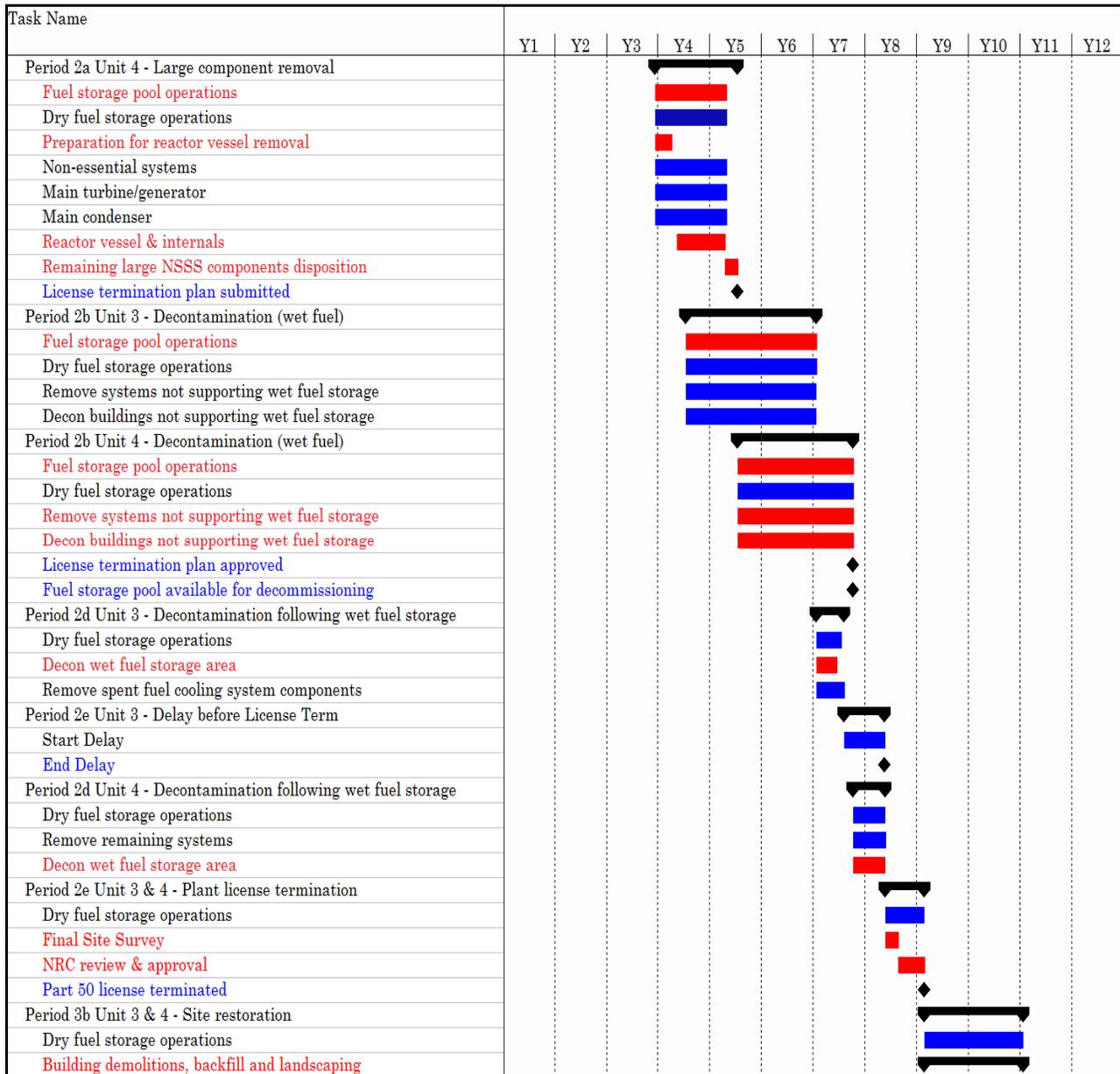
The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedule for decommissioning. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs. A second critical path is shown for the spent fuel storage period, which determines the release of the fuel handling building for final decontamination.

Project timelines are provided in Figures 4.2 and 4.3, with milestone dates based on the 2032 and 2033 shutdown dates for Units 3 and 4, respectively. The fuel pools are emptied approximately five and one half years after shutdown, while ISFSI operations continue until the DOE can complete the transfer of assemblies to its geologic repository. Deferred decommissioning in the SAFSTOR alternative is assumed to commence so that the operating license is terminated within a 60-year period from the cessation of plant operations.

**FIGURE 4.1  
ACTIVITY SCHEDULE**



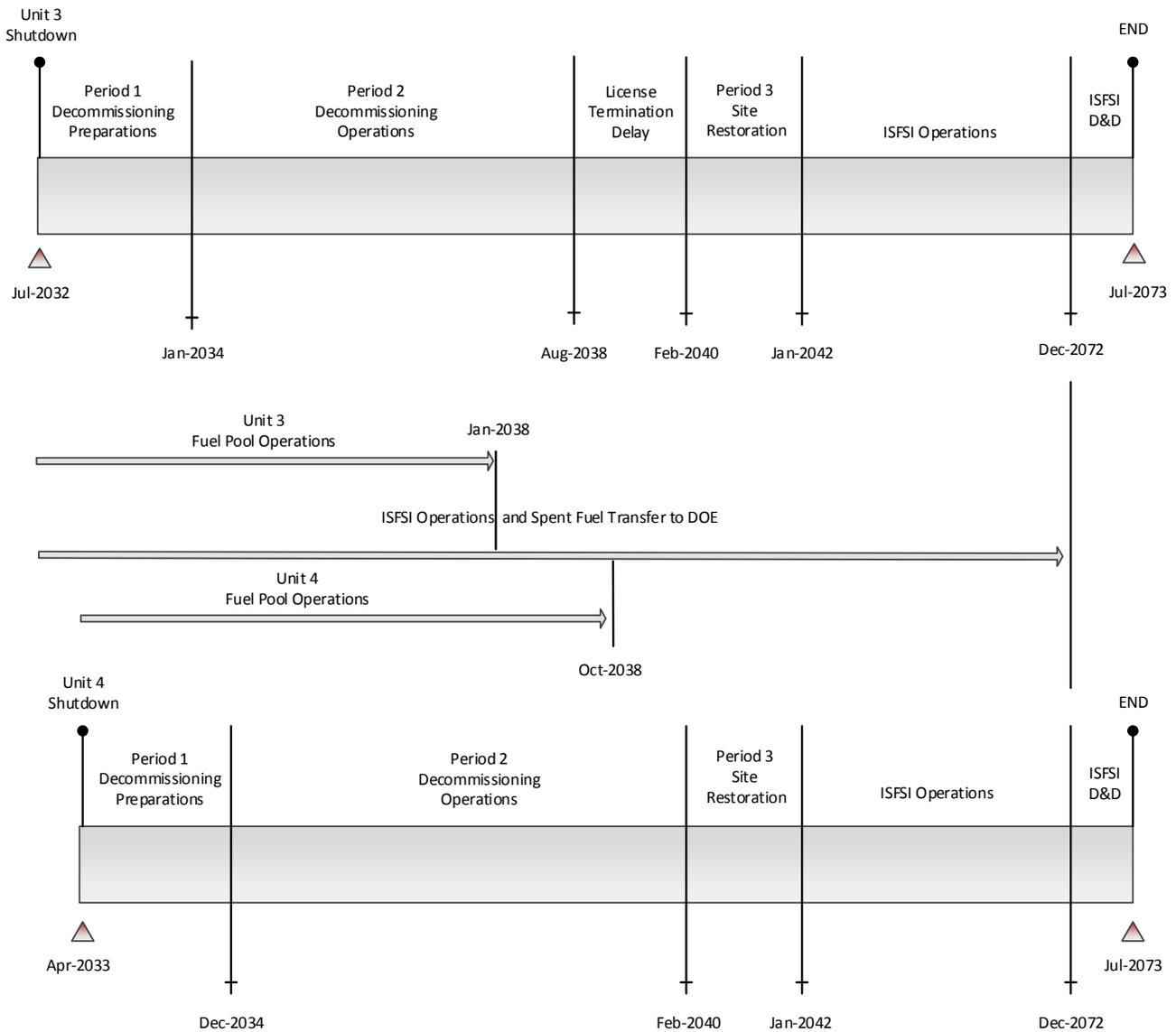
**FIGURE 4.1 (continued)**  
**ACTIVITY SCHEDULE**



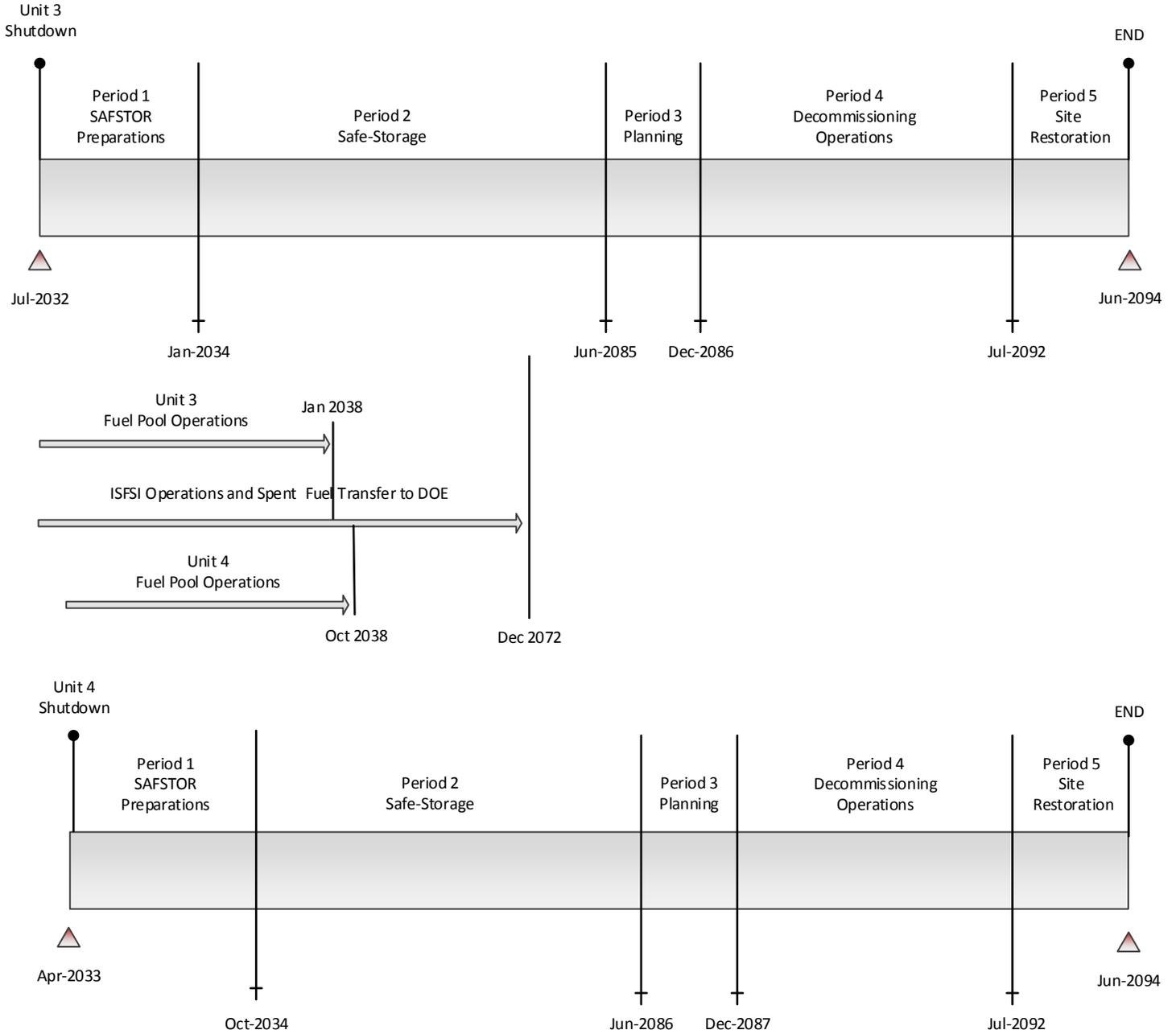
**LEGEND**

1. Red scheduling bars indicate critical path activities
2. Blue scheduling bars associated with major decommissioning periods, e.g., Period 1a, indicate overall duration of that period
3. Diamond symbols indicate major milestones

**FIGURE 4.2**  
**DECOMMISSIONING TIMELINE**  
**DECON**  
(not to scale)



**FIGURE 4.3**  
**DECOMMISSIONING TIMELINE**  
**SAFSTOR**  
(not to scale)



## **5. RADIOACTIVE WASTES**

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC license. This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,<sup>[33]</sup> the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, Part 71 defines radioactive material as it pertains to transportation and Part 61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR Parts 173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in 10 CFR §173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The destinations for the various waste streams from decommissioning are identified in Figures 5.1 and 5.2. The volumes are shown on a line-item basis in Appendices C and D, and summarized in Tables 5.1 and 5.2. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

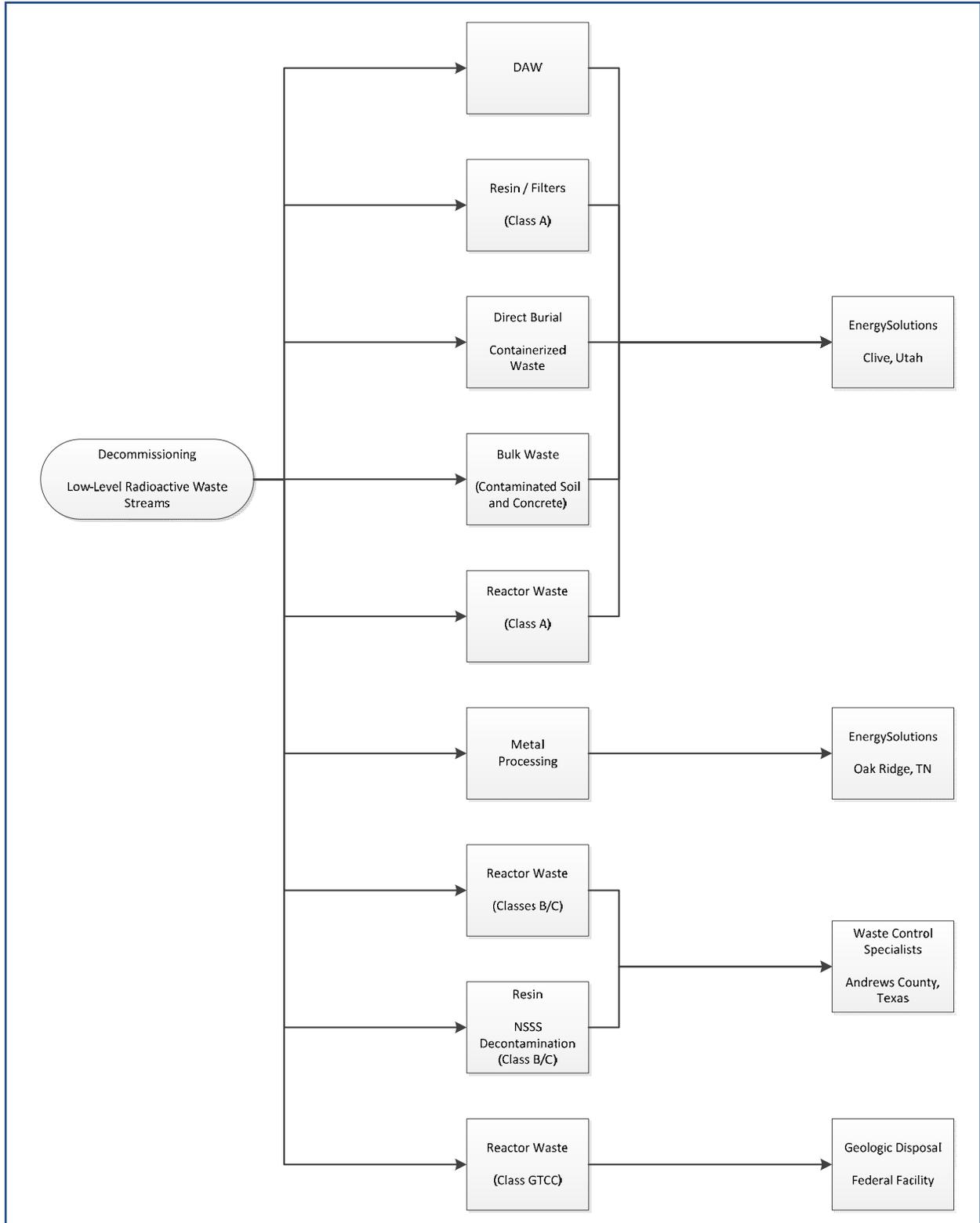
No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone (i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides). While the dose rates decrease with time, radionuclides such as <sup>137</sup>Cs will still control the disposition requirements.

The waste material produced in the decontamination and dismantling of the nuclear plants is primarily generated during Period 2 of DECON and Period 4 of SAFSTOR. Material that is considered potentially contaminated when removed from the radiological controlled area is sent to processing facilities in Tennessee for conditioning and disposal. Heavily contaminated components and activated materials are routed for controlled disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling.

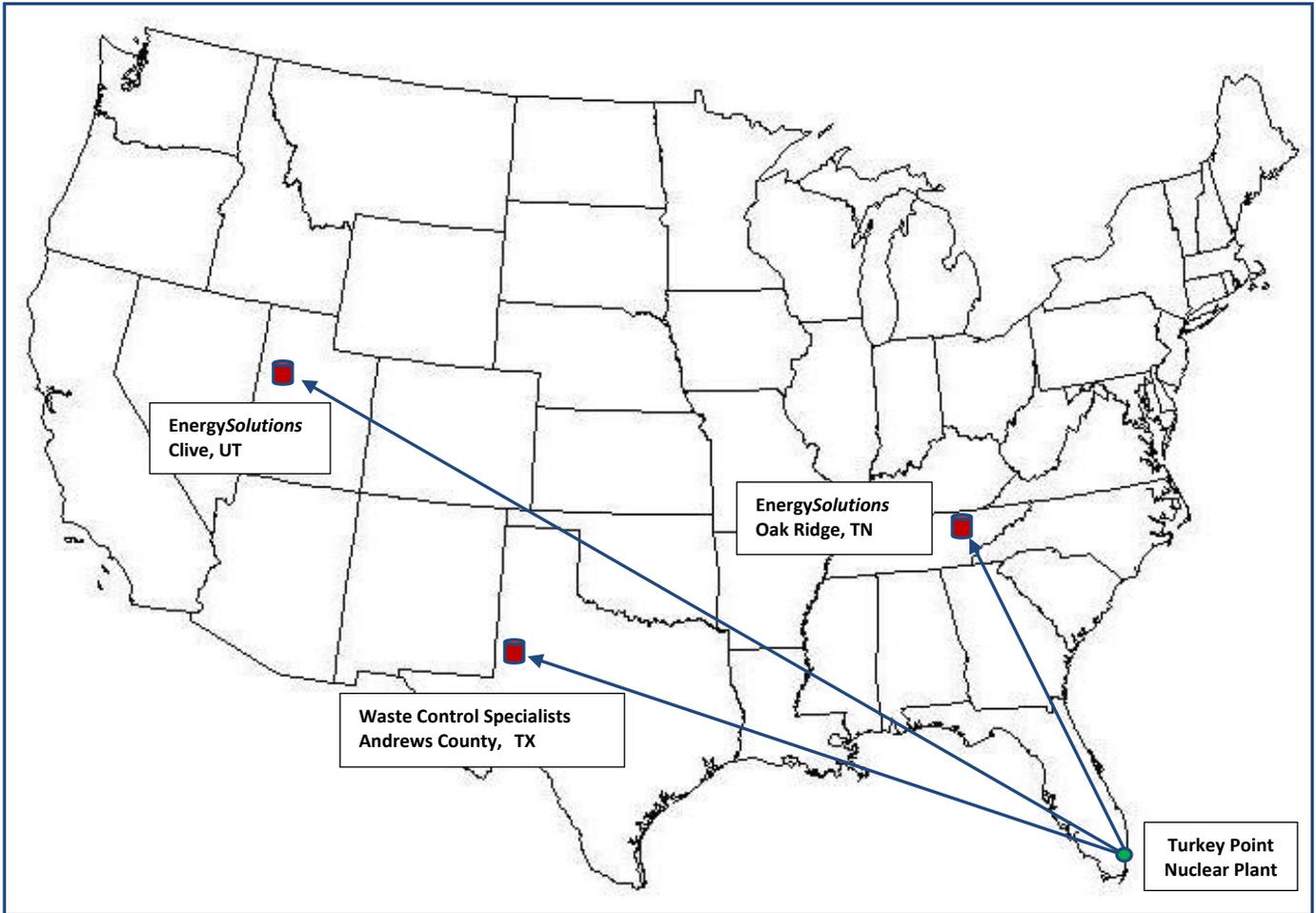
For purposes of constructing the estimates, FPL's current cost for disposal at the *EnergySolutions* facility was used for the majority of the radioactive waste produced from the decommissioning activities. Separate rates were used for containerized waste and large components, including the steam generators and reactor coolant pump motors. Demolition debris including miscellaneous steel, scaffolding, and concrete was disposed of at a bulk rate. The decommissioning waste stream also included resins and dry active waste.

Since *EnergySolutions* is not currently able to receive the more highly radioactive components generated in the decontamination and dismantling of the reactor, disposal costs for the Class B and C material were based upon published rates for the Andrews County disposal facility.

**FIGURE 5.1**  
**RADIOACTIVE WASTE DISPOSITION**



**FIGURE 5.2**  
**DECOMMISSIONING WASTE DESTINATIONS**  
**RADIOLOGICAL**



**TABLE 5.1  
DECON  
DECOMMISSIONING WASTE SUMMARY**

Waste Class	Waste Form	Cost Basis	Class <sup>[1]</sup>	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (at near-surface disposal facility)	Containerized and Bulk Debris	EnergySolutions	A	327,035	22,644,834
		WCS	B	2,466	272,059
		WCS	C	1,683	239,140
	Contaminated Soil	EnergySolutions	A	162,654	14,094,000
Greater than Class C (geologic repository)	Modified DSCs	Spent Fuel Equivalent	GTCC	4,123	815,256
Total <sup>[2]</sup>				497,960	38,065,289
Processed/Conditioned (at off-site recycling center)		Recycling Vendors	A	252,292	10,197,351

<sup>[1]</sup> Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

<sup>[2]</sup> Columns may not add due to rounding.

**TABLE 5.2**  
**SAFSTOR**  
**DECOMMISSIONING WASTE SUMMARY**

Waste Class	Waste Form	Cost Basis	Class <sup>[1]</sup>	Waste Volume (cubic feet)	Mass (pounds)
Low-Level Radioactive Waste (at near-surface disposal facility)	Containerized and Bulk Debris	EnergySolutions	A	277,405	18,696,001
		WCS	B	1,002	93,488
		WCS	C	1,683	239,140
	Contaminated Soil	EnergySolutions	A	162,654	14,094,000
Greater than Class C (geologic repository)	Modified DSCs	Spent Fuel Equivalent	GTCC	4,123	815,256
Total <sup>[2]</sup>				446,867	33,937,885
Processed/Conditioned (at off-site recycling center)		Recycling Vendors	A	302,969	12,306,015

<sup>[1]</sup> Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

<sup>[2]</sup> Columns may not add due to rounding.

## 6. RESULTS

The analysis to estimate the costs to decommission Turkey Point relied upon the site-specific, technical information developed for a previous analysis prepared in 2010. While not an engineering study, the estimates provide the owner with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear plant

The estimates described in this report are based on numerous fundamental assumptions, including a 60-year operating life, regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenarios assume continued operation of the plant's spent fuel pools for a minimum of five and one half years following the cessation of operations for continued cooling of the assemblies.

The cost projected to promptly decommission the plant, manage the spent fuel, and restore the site is estimated to be \$1,779.6 million. The majority of this cost (approximately 67.7%) is associated with the physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 27.0% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 5.3% is for the demolition of the designated structures and limited restoration of the site.

The cost projected for deferred decommissioning (SAFSTOR) is estimated to be \$2,100.6 million. The majority of this cost (approximately 66.8%) is associated with placing the plant in storage, ongoing caretaking of the plant during dormancy, and the eventual physical decontamination and dismantling of the nuclear plant so that the operating license can be terminated. Another 26.7% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 4.5% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 and 6.2, are either labor-related or associated with the management and disposition of the radioactive waste. Program management is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that FPL will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. The owner will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract

personnel will provide engineering services, e.g., for preparing the activity specifications, work procedures, activation, and structural analyses, under the direction of the owner. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating licenses are terminated, the staff is substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pools will remain operational for a minimum of five and one half years following the cessation of operations. The pools will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool area. Over the five and one half-year period, the spent fuel will be packaged into transportable canisters for loading into a DOE-provided transport cask or relocation to the ISFSI.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including plant equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, disposition of the majority of the low-level radioactive material requiring controlled disposal is at the *EnergySolutions'* facility. Highly activated components, requiring additional isolation from the environment (GTCC), are packaged for geologic disposal. The cost of geologic disposal is based upon a cost equivalent for spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary tables for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating license.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the plant's radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated plant components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear plant.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining plant surface areas and surrounding environs, sampling, isotopic analysis, and documentation of the findings. The status of any plant components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs are greatly reduced following the final cessation of plant operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

**TABLE 6.1**  
**DECON**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Total	Percentage
Decontamination	22,823	1.3
Removal	182,248	10.2
Packaging	48,546	2.7
Transportation	50,920	2.9
Waste Disposal	154,188	8.7
Off-site Waste Processing	26,902	1.5
Program Management <sup>[1]</sup>	572,181	32.2
Site Security	231,286	13.0
Spent Fuel Pool Isolation	21,250	1.2
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	289,358	16.3
Insurance and Regulatory Fees	46,349	2.6
Energy	40,588	2.3
Characterization and Licensing Surveys	37,306	2.1
Property Taxes	2,589	0.1
Miscellaneous Equipment	14,679	0.8
Fixed Overhead	29,643	1.7
INPO,NEI Fees	7,619	0.4
Florida LLRW Inspection Fee	1,074	0.1
<b>Total <sup>[3]</sup></b>	<b>1,779,550</b>	<b>100.0</b>

Cost Element	Total	Percentage
License Termination	1,205,581	67.7
Spent Fuel Management <sup>[4]</sup>	479,670	27.0
Site Restoration	94,298	5.3
<b>Total <sup>[3]</sup></b>	<b>1,779,550</b>	<b>100.0</b>

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

**TABLE 6.2**  
**SAFSTOR**  
**DECOMMISSIONING COST ELEMENTS**  
(thousands of 2015 dollars)

Cost Element	Total	Percentage
Decontamination	18,095	0.9
Removal	184,416	8.8
Packaging	33,871	1.6
Transportation	42,359	2.0
Waste Disposal	120,331	5.7
Off-site Waste Processing	31,097	1.5
Program Management <sup>[1]</sup>	709,476	33.8
Site Security	281,902	13.4
Spent Fuel Pool Isolation	21,250	1.0
Spent Fuel Management (Direct Costs) <sup>[2]</sup>	275,939	13.1
Insurance and Regulatory Fees	119,747	5.7
Energy	81,143	3.9
Characterization and Licensing Surveys	38,434	1.8
Property Taxes	3,266	0.2
Miscellaneous Equipment	38,098	1.8
Fixed Overhead	88,613	4.2
INPO,NEI Fees	11,520	0.5
Florida LLRW Inspection Fee	1,011	0.0
Total <sup>[3]</sup>	2,100,567	100.0

Cost Element	Total	Percentage
License Termination	1,444,824	68.8
Spent Fuel Management <sup>[4]</sup>	561,877	26.7
Site Restoration	93,866	4.5
Total <sup>[3]</sup>	2,100,567	100.0

<sup>[1]</sup> Includes engineering costs

<sup>[2]</sup> Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

<sup>[3]</sup> Columns may not add due to rounding

<sup>[4]</sup> Includes period-dependent costs such as Program Management costs

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## **7. REFERENCES**

(continued)

12. In 2008, the DOE issued a report to Congress in which it concluded that it did not have authority, under present law, to accept spent nuclear fuel for interim storage from decommissioned commercial nuclear power reactor sites. However, the Blue Ribbon Commission, in its final report, noted that: “[A]ccepting spent fuel according to the OFF [Oldest Fuel First] priority ranking instead of giving priority to shutdown reactor sites could greatly reduce the cost savings that could be achieved through consolidated storage if priority could be given to accepting spent fuel from shutdown reactor sites before accepting fuel from still-operating plants. .... The magnitude of the cost savings that could be achieved by giving priority to shutdown sites appears to be large enough (i.e., in the billions of dollars) to warrant DOE exercising its right under the Standard Contract to move this fuel first.” For planning purposes only, this estimate does not assume that Turkey Point, as a permanently shutdown plant, will receive priority; the fuel removal schedule assumed in this estimate is based upon DOE acceptance of fuel according to the “Oldest Fuel First” priority ranking. The plant owner will seek the most expeditious means of removing fuel from the site when DOE commences performance.
13. U.S. Code of Federal Regulations, Title 10, Part 50, “Domestic Licensing of Production and Utilization Facilities,” Subpart 54 (bb), “Conditions of Licenses”
14. “Low Level Radioactive Waste Policy Act,” Public Law 96-573, 1980
15. “Low-Level Radioactive Waste Policy Amendments Act of 1985,” Public Law 99-240, 1986
16. Waste is classified in accordance with U.S. Code of Federal Regulations, Title 10, Part 61.55
17. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, “Radiological Criteria for License Termination,” 62 Fed. Reg. 39058, July 21, 1997
18. “Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination,” EPA Memorandum OSWER No. 9200.4-18, August 22, 1997
19. U.S. Code of Federal Regulations, Title 40, Part 141.16, “Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in community water systems”

## **7. REFERENCES**

(continued)

20. "Memorandum of Understanding Between the Environmental Protection Agency and the Nuclear Regulatory Commission: Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites," OSWER 9295.8-06a, October 9, 2002
21. "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," NUREG/CR-1575, Rev. 1, EPA 402-R-97-016, Rev. 1, August 2000
22. T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986
23. W.J. Manion and T.S. LaGuardia, "Decommissioning Handbook," U.S. Department of Energy, DOE/EV/10128-1, November 1980
24. "Building Construction Cost Data 2015," Robert Snow Means Company, Inc., Kingston, Massachusetts
25. Project and Cost Engineers' Handbook, Second Edition, p. 239, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, 1984
26. U.S. Department of Transportation, Title 49 of the Code of Federal Regulations, "Transportation," Parts 173 through 178
27. Tri-State Motor Transit Company, published tariffs
28. J.C. Evans et al., "Long-Lived Activation Products in Reactor Materials" NUREG/CR-3474, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, August 1984
29. R.I. Smith, G.J. Konzek, W.E. Kennedy, Jr., "Technology, Safety and Costs of Decommissioning a Reference Pressurized Water Reactor Power Station," NUREG/CR-0130 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, June 1978
30. H.D. Oak, et al., "Technology, Safety and Costs of Decommissioning a Reference Boiling Water Reactor Power Station," NUREG/CR-0672 and addenda, Pacific Northwest Laboratory for the Nuclear Regulatory Commission, June 1980

## **7. REFERENCES**

(continued)

31. SECY-00-0145, "Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning," June 2000
32. "Microsoft Project Professional 2010," Microsoft Corporation, Redmond, WA
33. "Atomic Energy Act of 1954," (68 Stat. 919)

**APPENDIX A**  
**UNIT COST FACTOR DEVELOPMENT**

**APPENDIX A**  
**UNIT COST FACTOR DEVELOPMENT**

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

**1. SCOPE**

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

**2. CALCULATIONS**

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
-----			
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	<u>60</u>	<u>60</u>
Totals (Activity/Critical)		355	255
Duration adjustment(s):			
+ Respiratory protection adjustment (50% of critical duration)			128
+ Radiation/ALARA adjustment (37% of critical duration)			<u>95</u>
Adjusted work duration			478
+ Protective clothing adjustment (30% of adjusted duration)			<u>143</u>
Productive work duration			621
+ Work break adjustment (8.33 % of productive duration)			<u>52</u>
Total work duration (minutes)			673

**\*\*\* Total duration = 11.217 hr \*\*\***

\* alpha designators indicate activities that can be performed in parallel

**APPENDIX A**  
(continued)

**3. LABOR REQUIRED**

Crew	Number	Duration (hours)	Rate (\$/hr)	Cost
Laborers	3.00	11.217	\$34.75	\$1,169.37
Craftsmen	2.00	11.217	\$51.97	\$1,165.90
Foreman	1.00	11.217	\$57.06	\$640.04
General Foreman	0.25	11.217	\$59.34	\$166.40
Fire Watch	0.05	11.217	\$34.75	\$19.49
Health Physics Technician	1.00	11.217	\$52.77	<u>\$591.92</u>
Total Labor Cost				\$3,753.12

**4. EQUIPMENT & CONSUMABLES COSTS**

Equipment Costs	none
Consumables/Materials Costs	
-Universal sorbent 50 @ \$0.63 sq ft <sup>{1}</sup>	\$31.50
-Tarpaulin, oil resistant/fire retardant) 50 @ \$0.39/sq ft <sup>{2}</sup>	\$19.50
-Gas torch consumables 1 @ \$18.91/hr x 1 hr <sup>{3}</sup>	<u>\$18.91</u>
Subtotal cost of equipment and materials	\$69.91
Overhead & profit on equipment and materials @ 17.00 %	<u>\$11.88</u>
Total costs, equipment & material	\$81.79

**TOTAL COST:**

<b>Removal of contaminated heat exchanger &lt;3000 pounds:</b>	<b>\$3,834.91</b>
Total labor cost:	\$3,753.12
Total equipment/material costs:	\$81.79
Total craft labor man-hours required per unit:	81.88

## **5. NOTES AND REFERENCES**

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.
- References for equipment & consumables costs:
  1. [www.mcmaster.com](http://www.mcmaster.com) online catalog, McMaster Carr Spill Control (7193T88)
  2. R.S. Means (2015) Division 01 56, Section 13.60-0600, page 22
  3. R.S. Means (2015) Division 01 54 33, Section 40-6360, page 706
- Material and consumable costs were adjusted using the regional indices for Miami, Florida.

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(DECON: Power Block Structures Only)**

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of clean instrument and sampling tubing, \$/linear foot	0.40
Removal of clean pipe 0.25 to 2 inches diameter, \$/linear foot	4.24
Removal of clean pipe >2 to 4 inches diameter, \$/linear foot	6.19
Removal of clean pipe >4 to 8 inches diameter, \$/linear foot	12.36
Removal of clean pipe >8 to 14 inches diameter, \$/linear foot	23.45
Removal of clean pipe >14 to 20 inches diameter, \$/linear foot	30.61
Removal of clean pipe >20 to 36 inches diameter, \$/linear foot	45.00
Removal of clean pipe >36 inches diameter, \$/linear foot	53.42
Removal of clean valve >2 to 4 inches	82.27
Removal of clean valve >4 to 8 inches	123.56
Removal of clean valve >8 to 14 inches	234.53
Removal of clean valve >14 to 20 inches	306.08
Removal of clean valve >20 to 36 inches	450.05
Removal of clean valve >36 inches	534.21
Removal of clean pipe hanger for small bore piping	29.12
Removal of clean pipe hanger for large bore piping	98.76
Removal of clean pump, <300 pound	210.89
Removal of clean pump, 300-1000 pound	588.37
Removal of clean pump, 1000-10,000 pound	2,300.81
Removal of clean pump, >10,000 pound	4,458.29
Removal of clean pump motor, 300-1000 pound	244.36
Removal of clean pump motor, 1000-10,000 pound	953.70
Removal of clean pump motor, >10,000 pound	2,145.80
Removal of clean heat exchanger <3000 pound	1,243.26
Removal of clean heat exchanger >3000 pound	3,141.48
Removal of clean feedwater heater/deaerator	8,800.89
Removal of clean moisture separator/reheater	18,020.74
Removal of clean tank, <300 gallons	270.96
Removal of clean tank, 300-3000 gallon	849.72
Removal of clean tank, >3000 gallons, \$/square foot surface area	7.25

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of clean electrical equipment, <300 pound	112.87
Removal of clean electrical equipment, 300-1000 pound	397.84
Removal of clean electrical equipment, 1000-10,000 pound	795.67
Removal of clean electrical equipment, >10,000 pound	1,913.61
Removal of clean electrical transformer < 30 tons	1,328.97
Removal of clean electrical transformer > 30 tons	3,827.23
Removal of clean standby diesel generator, <100 kW	1,357.43
Removal of clean standby diesel generator, 100 kW to 1 MW	3,029.89
Removal of clean standby diesel generator, >1 MW	6,272.48
Removal of clean electrical cable tray, \$/linear foot	10.71
Removal of clean electrical conduit, \$/linear foot	4.69
Removal of clean mechanical equipment, <300 pound	112.87
Removal of clean mechanical equipment, 300-1000 pound	397.84
Removal of clean mechanical equipment, 1000-10,000 pound	795.67
Removal of clean mechanical equipment, >10,000 pound	1,913.61
Removal of clean HVAC equipment, <300 pound	136.49
Removal of clean HVAC equipment, 300-1000 pound	478.03
Removal of clean HVAC equipment, 1000-10,000 pound	952.72
Removal of clean HVAC equipment, >10,000 pound	1,913.61
Removal of clean HVAC ductwork, \$/pound	0.43
Removal of contaminated instrument and sampling tubing, \$/linear foot	1.36
Removal of contaminated pipe 0.25 to 2 inches diameter, \$/linear foot	19.91
Removal of contaminated pipe >2 to 4 inches diameter, \$/linear foot	33.23
Removal of contaminated pipe >4 to 8 inches diameter, \$/linear foot	53.52
Removal of contaminated pipe >8 to 14 inches diameter, \$/linear foot	102.57
Removal of contaminated pipe >14 to 20 inches diameter, \$/linear foot	122.68
Removal of contaminated pipe >20 to 36 inches diameter, \$/linear foot	168.50
Removal of contaminated pipe >36 inches diameter, \$/linear foot	198.49
Removal of contaminated valve >2 to 4 inches	403.16
Removal of contaminated valve >4 to 8 inches	479.96

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of contaminated valve >8 to 14 inches	966.06
Removal of contaminated valve >14 to 20 inches	1,224.57
Removal of contaminated valve >20 to 36 inches	1,625.29
Removal of contaminated valve >36 inches	1,925.26
Removal of contaminated pipe hanger for small bore piping	131.44
Removal of contaminated pipe hanger for large bore piping	420.81
Removal of contaminated pump, <300 pound	860.01
Removal of contaminated pump, 300-1000 pound	1,985.85
Removal of contaminated pump, 1000-10,000 pound	6,278.71
Removal of contaminated pump, >10,000 pound	15,291.49
Removal of contaminated pump motor, 300-1000 pound	862.03
Removal of contaminated pump motor, 1000-10,000 pound	2,573.84
Removal of contaminated pump motor, >10,000 pound	5,778.81
Removal of contaminated heat exchanger <3000 pound	3,834.91
Removal of contaminated heat exchanger >3000 pound	11,175.89
Removal of contaminated tank, <300 gallons	1,433.76
Removal of contaminated tank, >300 gallons, \$/square foot	27.55
Removal of contaminated electrical equipment, <300 pound	656.06
Removal of contaminated electrical equipment, 300-1000 pound	1,601.01
Removal of contaminated electrical equipment, 1000-10,000 pound	3,084.32
Removal of contaminated electrical equipment, >10,000 pound	6,090.99
Removal of contaminated electrical cable tray, \$/linear foot	31.77
Removal of contaminated electrical conduit, \$/linear foot	15.88
Removal of contaminated mechanical equipment, <300 pound	729.63
Removal of contaminated mechanical equipment, 300-1000 pound	1,767.22
Removal of contaminated mechanical equipment, 1000-10,000 pound	3,398.90
Removal of contaminated mechanical equipment, >10,000 pound	6,090.99
Removal of contaminated HVAC equipment, <300 pound	729.63
Removal of contaminated HVAC equipment, 300-1000 pound	1,767.22
Removal of contaminated HVAC equipment, 1000-10,000 pound	3,398.90

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Removal of contaminated HVAC equipment, >10,000 pound	6,090.99
Removal of contaminated HVAC ductwork, \$/pound	2.00
Removal/plasma arc cut of contaminated thin metal components, \$/linear in.	3.47
Additional decontamination of surface by washing, \$/square foot	7.17
Additional decontamination of surfaces by hydrolasing, \$/square foot	32.41
Decontamination rig hook up and flush, \$/ 250 foot length	6,133.90
Chemical flush of components/systems, \$/gallon	20.21
Removal of clean standard reinforced concrete, \$/cubic yard	133.53
Removal of grade slab concrete, \$/cubic yard	172.83
Removal of clean concrete floors, \$/cubic yard	357.14
Removal of sections of clean concrete floors, \$/cubic yard	1,039.83
Removal of clean heavily rein concrete w/#9 rebar, \$/cubic yard	233.74
Removal of contaminated heavily rein concrete w/#9 rebar, \$/cubic yard	2,021.20
Removal of clean heavily rein concrete w/#18 rebar, \$/cubic yard	295.59
Removal of contaminated heavily rein concrete w/#18 rebar, \$/cubic yard	2,672.46
Removal heavily rein concrete w/#18 rebar & steel embedments, \$/cubic yard	433.27
Removal of below-grade suspended floors, \$/cubic yard	357.14
Removal of clean monolithic concrete structures, \$/cubic yard	855.55
Removal of contaminated monolithic concrete structures, \$/cubic yard	2,008.45
Removal of clean foundation concrete, \$/cubic yard	675.03
Removal of contaminated foundation concrete, \$/cubic yard	1,871.89
Explosive demolition of bulk concrete, \$/cubic yard	30.18
Removal of clean hollow masonry block wall, \$/cubic yard	25.24
Removal of contaminated hollow masonry block wall, \$/cubic yard	66.00
Removal of clean solid masonry block wall, \$/cubic yard	25.24
Removal of contaminated solid masonry block wall, \$/cubic yard	66.00
Backfill of below-grade voids, \$/cubic yard	33.35
Removal of subterranean tunnels/voids, \$/linear foot	106.26
Placement of concrete for below-grade voids, \$/cubic yard	130.15
Excavation of clean material, \$/cubic yard	3.17

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Excavation of contaminated material, \$/cubic yard	41.38
Removal of clean concrete rubble (tipping fee included), \$/cubic yard	25.08
Removal of contaminated concrete rubble, \$/cubic yard	26.60
Removal of building by volume, \$/cubic foot	0.30
Removal of clean building metal siding, \$/square foot	1.17
Removal of contaminated building metal siding, \$/square foot	4.13
Removal of standard asphalt roofing, \$/square foot	1.90
Removal of transite panels, \$/square foot	1.94
Scarifying contaminated concrete surfaces (drill & spall), \$/square foot	12.11
Scabbling contaminated concrete floors, \$/square foot	7.20
Scabbling contaminated concrete walls, \$/square foot	18.85
Scabbling contaminated ceilings, \$/square foot	64.51
Scabbling structural steel, \$/square foot	5.85
Removal of clean overhead crane/monorail < 10 ton capacity	567.58
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,660.08
Removal of clean overhead crane/monorail >10-50 ton capacity	1,362.17
Removal of contaminated overhead crane/monorail >10-50 ton capacity	3,983.50
Removal of polar crane > 50 ton capacity	5,748.97
Removal of gantry crane > 50 ton capacity	23,920.16
Removal of structural steel, \$/pound	0.19
Removal of clean steel floor grating, \$/square foot	4.35
Removal of contaminated steel floor grating, \$/square foot	12.80
Removal of clean free standing steel liner, \$/square foot	10.88
Removal of contaminated free standing steel liner, \$/square foot	32.12
Removal of clean concrete-anchored steel liner, \$/square foot	5.44
Removal of contaminated concrete-anchored steel liner, \$/square foot	37.46
Placement of scaffolding in clean areas, \$/square foot	15.15
Placement of scaffolding in contaminated areas, \$/square foot	24.26
Landscaping with topsoil, \$/acre	24,041.71
Cost of CPC B-88 LSA box & preparation for use	2,068.19

**APPENDIX B**

**UNIT COST FACTOR LISTING  
(Power Block Structures Only)**

<b>Unit Cost Factor</b>	<b>Cost/Unit(\$)</b>
Cost of CPC B-25 LSA box & preparation for use	1,891.24
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,533.15
Cost of CPC B-144 LSA box & preparation for use	10,605.35
Cost of LSA drum & preparation for use	194.79
Cost of cask liner for CNSI 8 120A cask (resins)	12,453.12
Cost of cask liner for CNSI 8 120A cask (filters)	8,888.50
Decontamination of surfaces with vacuuming, \$/square foot	0.74

**APPENDIX C  
DETAILED COST ANALYSIS  
DECON**

**Tables**

C-1	Turkey Point Nuclear Plant, Unit 3.....	2
C-2	Turkey Point Nuclear Plant, Unit 4.....	12

Table C-1  
Turkey Point Nuclear Plant, Unit 3  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
<b>PERIOD 1a - Shutdown through Transition</b>																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.3	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-
1a.1.4	Notification of Permanent Defueling	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	254	38	292	292	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	584	88	672	672	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	953	143	1,096	1,096	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	394	59	453	453	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	635	95	731	731	-	-	-	-	-	-	-	-	-	5,000
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	520	78	598	598	-	-	-	-	-	-	-	-	-	4,096
1a.1.16	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	625	94	719	647	-	72	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	529	79	609	548	-	61	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	64	10	73	73	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	902	135	1,037	1,037	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	826	124	950	950	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	64	10	73	73	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	396	59	456	456	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	203	30	234	117	-	117	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	51	8	58	-	-	58	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	51	8	58	-	-	58	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	396	59	456	228	-	228	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	584	88	672	672	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	114	17	131	66	-	66	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,806	721	5,527	4,867	-	660	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,100	465	3,565	3,565	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlp/ tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	156	23	180	180	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	14,770	2,216	16,986	16,326	-	660	-	-	-	-	-	-	-	73,753
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	3,197	479	3,676	-	3,676	-	-	-	-	-	-	-	-	-
1a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
1a.3.3	Fixed Overhead	-	-	-	-	-	-	1,780	267	2,047	2,047	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	4,978	747	5,724	2,048	3,676	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,427	143	1,569	1,569	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	556	56	611	611	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	394	-	-	-	-	-	99	493	493	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	706	-	-	-	-	-	106	812	812	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	10	3	-	35	-	10	59	59	-	-	493	-	-	-	-	9,854	16	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,920	438	3,358	3,358	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,156	116	1,272	1,272	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	667	67	734	-	734	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	797	120	917	-	917	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	-
1a.4.11	INPO Fees	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	-
1a.4.12	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-

Table C-1  
Turkey Point Nuclear Plant, Unit 3  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 1a Period-Dependent Costs (continued)																						
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,451	1,118	8,569	8,569	-	-	-	-	-	-	-	-	-	147,043	
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	31,842	4,776	36,618	36,618	-	-	-	-	-	-	-	-	-	423,400	
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,100	10	3	-	35	48,068	7,175	56,392	54,685	1,707	-	-	493	-	-	-	-	9,854	16	570,443
1a.0	TOTAL PERIOD 1a COST	-	1,100	10	3	-	35	67,816	10,137	79,102	73,059	5,383	660	-	493	-	-	-	-	9,854	16	644,196
<b>PERIOD 1b - Decommissioning Preparations</b>																						
Period 1b Direct Decommissioning Activities																						
Detailed Work Procedures																						
1b.1.1.1	Plant systems	-	-	-	-	-	-	601	90	692	622	-	69	-	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	318	48	365	365	-	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	172	26	197	49	-	148	-	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	461	69	530	530	-	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	152	23	175	88	-	88	-	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	152	23	175	175	-	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	584	88	672	672	-	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	127	19	146	73	-	73	-	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	198	30	228	-	-	228	-	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	198	30	228	-	-	228	-	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	347	52	399	359	-	40	-	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	347	52	399	359	-	40	-	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	4,224	634	4,857	3,944	-	913	-	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	587	-	-	-	-	-	-	293	880	880	-	-	-	-	-	-	-	-	-	-	1,067
1b.1	Subtotal Period 1b Activity Costs	587	-	-	-	-	-	4,224	927	5,737	4,823	-	913	-	-	-	-	-	-	-	-	33,243
Period 1b Additional Costs																						
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,087	1,663	12,750	12,750	-	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	5,854	1,756	7,610	7,610	-	-	-	-	-	-	-	-	-	-	30,500
1b.2.3	Misc Hazardous Waste	-	-	611	193	4,947	-	-	832	6,583	6,583	-	-	23,332	-	-	-	-	-	1,232,428	4,905	-
1b.2.4	Asbestos Remediation	-	3,336	2	224	-	1,182	-	1,163	5,908	5,908	-	-	-	12,771	-	-	-	-	166,023	38,278	-
1b.2	Subtotal Period 1b Additional Costs	-	3,336	613	418	4,947	1,182	16,941	5,415	32,851	32,851	-	-	23,332	12,771	-	-	-	-	1,398,451	73,683	10,852
Period 1b Collateral Costs																						
1b.3.1	Decon equipment	918	-	-	-	-	-	-	138	1,056	1,056	-	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,549	232	1,781	1,781	-	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	31	-	21	91	-	82	-	52	278	278	-	-	-	199	-	-	-	-	11,925	39	-
1b.3.4	Process decommissioning chemical flush waste	2	-	64	368	-	2,759	-	752	3,945	3,945	-	-	-	-	646	-	-	-	68,816	121	-
1b.3.5	Small tool allowance	-	39	-	-	-	-	-	6	45	45	-	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,600	-	-	-	-	-	-	240	1,840	1,840	-	-	-	-	-	-	-	-	-	-	-
1b.3.8	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,458	369	2,827	-	2,827	-	-	-	-	-	-	-	-	-	-
1b.3.9	Florida LLRW Inspection Fee	-	-	-	-	-	-	27	3	30	30	-	-	-	-	-	-	-	-	-	-	-
1b.3.10	Fixed Overhead	-	-	-	-	-	-	902	135	1,038	1,038	-	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,551	1,239	85	460	-	2,841	4,936	2,107	14,219	11,392	2,827	-	199	646	-	-	-	-	80,740	160	-
Period 1b Period-Dependent Costs																						
1b.4.1	Decon supplies	28	-	-	-	-	-	-	7	36	36	-	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	719	72	790	790	-	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	252	25	277	277	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	432	-	-	-	-	-	108	540	540	-	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	358	-	-	-	-	-	54	411	411	-	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	6	2	-	22	-	6	36	36	-	-	-	303	-	-	-	-	6,050	10	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	2,960	444	3,404	3,404	-	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	347	35	382	382	-	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	338	34	372	-	372	-	-	-	-	-	-	-	-	-	-

Table C-1  
Turkey Point Nuclear Plant, Unit 3  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1b Period-Dependent Costs (continued)																					
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	404	61	465	-	465	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	25	4	29	-	29	-	-	-	-	-	-	-	-	-
1b.4.12	NEI Fees	-	-	-	-	-	-	184	18	202	202	-	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	3,777	567	4,343	4,343	-	-	-	-	-	-	-	-	-	74,529
1b.4.14	DOC Staff Cost	-	-	-	-	-	-	5,481	822	6,303	6,303	-	-	-	-	-	-	-	-	-	64,486
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	16,225	2,434	18,659	18,659	-	-	-	-	-	-	-	-	-	215,657
1b.4	Subtotal Period 1b Period-Dependent Costs	28	790	6	2	-	22	30,711	4,690	36,250	35,385	865	-	-	303	-	-	-	6,050	10	354,671
1b.0	TOTAL PERIOD 1b COST	3,166	5,365	704	879	4,947	4,045	56,812	13,138	89,056	84,451	3,692	913	23,332	13,272	646	-	-	1,485,242	74,919	398,766
<b>PERIOD 1 TOTALS</b>		<b>3,166</b>	<b>6,465</b>	<b>714</b>	<b>883</b>	<b>4,947</b>	<b>4,080</b>	<b>124,628</b>	<b>23,275</b>	<b>168,158</b>	<b>157,509</b>	<b>9,075</b>	<b>1,574</b>	<b>23,332</b>	<b>13,765</b>	<b>646</b>	<b>-</b>	<b>-</b>	<b>1,495,096</b>	<b>74,935</b>	<b>1,042,962</b>
<b>PERIOD 2a - Large Component Removal</b>																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	55	44	8	22	-	173	-	86	387	387	-	-	-	425	-	-	-	48,604	1,954	-
2a.1.1.2	Pressurizer Relief Tank	23	20	6	14	-	105	-	46	213	213	-	-	-	265	-	-	-	29,424	863	-
2a.1.1.3	Reactor Coolant Pumps & Motors	45	68	107	154	-	784	-	269	1,428	1,428	-	-	-	2,396	-	-	-	555,300	2,764	100
2a.1.1.4	Pressurizer	36	52	506	109	-	963	-	339	2,004	2,004	-	-	-	2,944	-	-	-	246,802	2,341	938
2a.1.1.5	Steam Generators	234	3,461	1,913	4,263	1,408	4,213	-	3,077	18,569	18,569	-	-	26,258	12,879	-	-	-	2,271,299	11,704	1,750
2a.1.1.6	Retired Steam Generator Units	-	-	685	3,937	-	4,083	-	1,680	10,385	10,385	-	-	-	12,483	-	-	-	1,364,708	2,380	1,125
2a.1.1.7	CRDMs/ICIs/Service Structure Removal	133	222	203	93	-	460	-	271	1,381	1,381	-	-	-	3,474	-	-	-	129,094	7,028	-
2a.1.1.8	Reactor Vessel Internals	86	3,027	10,728	2,012	-	11,084	309	11,087	38,333	38,333	-	-	-	376	587	842	-	223,692	27,283	1,223
2a.1.1.9	Reactor Vessel	90	5,112	2,182	1,645	-	2,603	309	6,184	18,125	18,125	-	-	-	7,746	-	-	-	788,173	27,283	1,223
2a.1.1	Totals	703	12,006	16,337	12,248	1,408	24,467	618	23,038	90,825	90,825	-	-	26,258	42,989	587	842	-	5,657,096	83,602	6,360
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	291	178	147	335	892	-	386	2,229	2,229	-	-	4,300	3,792	-	-	-	444,140	6,062	-
2a.1.3	Main Condensers	-	969	206	171	388	1,033	-	605	3,371	3,371	-	-	4,981	4,392	-	-	-	514,460	20,428	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Containment	-	734	-	-	-	-	-	110	844	844	-	-	-	-	-	-	-	-	8,127	-
2a.1.4.2	Fuel Handling	-	56	-	-	-	-	-	8	64	64	-	-	-	-	-	-	-	-	663	-
2a.1.4	Totals	-	790	-	-	-	-	-	118	908	908	-	-	-	-	-	-	-	-	8,790	-
Disposal of Plant Systems																					
2a.1.5.1	Amertap	-	77	-	-	-	-	-	12	88	-	-	88	-	-	-	-	-	-	1,715	-
2a.1.5.2	Auxiliary Feedwater	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	98	-
2a.1.5.3	Auxiliary Feedwater - Insulated	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	411	-
2a.1.5.4	Auxiliary Feedwater - Insulated - RCA	-	132	6	10	22	64	-	54	288	288	-	-	308	270	-	-	-	30,383	2,633	-
2a.1.5.5	Auxiliary Feedwater - RCA	-	29	2	2	5	15	-	12	66	66	-	-	75	65	-	-	-	7,390	572	-
2a.1.5.6	Auxiliary Steam	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	10	-
2a.1.5.7	Auxiliary Steam - Insulated	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	734	-
2a.1.5.8	Auxiliary Steam - Insulated - RCA	-	7	0	1	2	4	-	3	18	18	-	-	31	17	-	-	-	2,430	141	-
2a.1.5.9	Auxiliary Steam - RCA	-	0	0	0	0	0	-	0	0	0	-	-	0	0	-	-	-	17	1	-
2a.1.5.10	Breathing Air - Insulated - RCA	-	5	0	0	1	2	-	2	11	11	-	-	9	9	-	-	-	989	104	-
2a.1.5.11	Breathing Air - RCA	-	18	1	1	3	9	-	7	39	39	-	-	36	37	-	-	-	3,897	351	-
2a.1.5.12	Chemical & Volume Control	59	102	15	23	37	150	-	103	489	489	-	-	521	648	-	-	-	63,384	3,073	-
2a.1.5.13	Chemical & Volume Control - Insulated	164	278	19	25	12	186	-	205	889	889	-	-	167	789	-	-	-	59,007	8,355	-
2a.1.5.14	Circulating Water	-	95	-	-	-	-	-	14	110	-	-	110	-	-	-	-	-	-	2,204	-
2a.1.5.15	Component Cooling Water	-	154	-	-	-	-	-	23	177	-	-	177	-	-	-	-	-	-	3,558	-
2a.1.5.16	Component Cooling Water - RCA	-	377	34	65	284	301	-	225	1,287	1,287	-	-	4,044	1,278	-	-	-	248,734	7,575	-
2a.1.5.17	Condensate	-	175	-	-	-	-	-	26	201	-	-	201	-	-	-	-	-	-	3,960	-
2a.1.5.18	Condensate - Insulated	-	55	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	1,309	-
2a.1.5.19	Condensate Polishing	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	734	-
2a.1.5.20	Condensate Polishing - Ins	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	1,986	-
2a.1.5.21	Condensate Recovery	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	373	-
2a.1.5.22	Condensate Recovery - Insulated	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	60	-
2a.1.5.23	Condensate Recovery - Insulated - RCA	-	5	0	0	1	3	-	2	12	12	-	-	10	12	-	-	-	1,161	108	-
2a.1.5.24	Condensate Recovery - RCA	-	23	1	2	3	12	-	10	50	50	-	-	43	52	-	-	-	5,178	435	-
2a.1.5.25	Condensate Storage	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,572	-

Table C-1  
Turkey Point Nuclear Plant, Unit 3  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed	Burial Volumes				Burial/	Craft Manhours	Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		Contractor Manhours
Disposal of Plant Systems (continued)																					
2a.1.5.26	Condenser	-	23	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	545	-
2a.1.5.27	Containment Post Accident Eval	-	1	0	0	0	0	-	0	1	1	-	-	2	1	-	-	-	132	16	-
2a.1.5.28	Electrical - Clean	-	1,405	-	-	-	-	-	211	1,616	-	-	1,616	-	-	-	-	-	-	31,193	-
2a.1.5.29	Extraction Steam	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	244	-
2a.1.5.30	Extraction Steam - Insulated	-	50	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	1,194	-
2a.1.5.31	Feedwater	-	49	-	-	-	-	-	7	56	-	-	56	-	-	-	-	-	-	1,095	-
2a.1.5.32	Feedwater - Insulated	-	141	-	-	-	-	-	21	162	-	-	162	-	-	-	-	-	-	3,321	-
2a.1.5.33	Feedwater - Insulated - RCA	-	68	5	10	45	47	-	38	214	214	-	-	640	200	-	-	-	39,226	1,388	-
2a.1.5.34	Feedwater - RCA	-	6	0	1	4	4	-	3	19	19	-	-	55	18	-	-	-	3,463	122	-
2a.1.5.35	Feedwater Heater Drains & Vents	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,053	-
2a.1.5.36	Feedwater Heater Drains & Vents - Ins	-	310	-	-	-	-	-	46	356	-	-	356	-	-	-	-	-	-	7,237	-
2a.1.5.37	Fire Protection	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	394	-
2a.1.5.38	Generator	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	126	-
2a.1.5.39	Generator - Insulated	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	47	-
2a.1.5.40	Instrument Air	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	291	-
2a.1.5.41	Instrument Air - Insulated	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	239	-
2a.1.5.42	Intake Cooling Water	-	151	-	-	-	-	-	23	173	-	-	173	-	-	-	-	-	-	3,548	-
2a.1.5.43	Main Steam - Insulated	-	170	-	-	-	-	-	25	195	-	-	195	-	-	-	-	-	-	3,903	-
2a.1.5.44	Main Steam - Insulated - RCA	-	46	4	8	34	34	-	27	152	152	-	-	483	144	-	-	-	29,147	945	-
2a.1.5.45	Reactor Coolant - Insulated	41	79	5	7	4	50	-	55	241	241	-	-	62	211	-	-	-	16,522	2,269	-
2a.1.5.46	Safety Injection	-	218	9	28	256	35	-	107	653	653	-	-	3,638	156	-	-	-	157,708	4,565	-
2a.1.5.47	Safety Injection - Insulated	-	118	9	14	46	76	-	58	321	321	-	-	656	325	-	-	-	48,143	2,328	-
2a.1.5.48	Sample - NSSS	-	24	1	1	6	6	-	9	47	47	-	-	83	26	-	-	-	5,132	521	-
2a.1.5.49	Sample - NSSS - Ins	-	23	1	1	0	7	-	8	39	39	-	-	4	28	-	-	-	2,012	514	-
2a.1.5.50	Screen Wash	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	531	-
2a.1.5.51	Secondary Sample	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	83	-
2a.1.5.52	Secondary Sample - RCA	-	5	0	0	2	1	-	2	10	10	-	-	29	4	-	-	-	1,475	108	-
2a.1.5.53	Secondary Wet Layup	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	503	-
2a.1.5.54	Secondary Wet Layup - RCA	-	20	1	2	5	12	-	9	49	49	-	-	67	53	-	-	-	6,202	379	-
2a.1.5.55	Turbine Building HVAC	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	409	-
2a.1.5.56	Turbine Lube Oil	-	40	-	-	-	-	-	6	47	-	-	47	-	-	-	-	-	-	906	-
2a.1.5.57	Turbine Plant Chemical Addition	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	77	-
2a.1.5.58	Turbine Plant Cooling Water	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	1,975	-
2a.1.5.59	Turbine Plant Cooling Water - Insulated	-	48	-	-	-	-	-	7	55	-	-	55	-	-	-	-	-	-	1,107	-
2a.1.5.60	Turbine Steam	-	64	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,496	-
2a.1.5.61	Turbine Steam - Insulated	-	28	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	669	-
2a.1.5	Totals	264	5,141	115	203	771	1,019	-	1,474	8,987	4,897	-	4,090	10,968	4,343	-	-	-	731,731	117,413	-
2a.1.6	Scaffolding in support of decommissioning	-	177	3	1	11	3	-	47	244	244	-	-	146	13	-	-	-	7,439	4,338	-
2a.1	Subtotal Period 2a Activity Costs	967	19,374	16,839	12,771	2,912	27,415	618	25,668	106,565	102,474	-	4,090	46,653	55,528	587	842	-	7,354,866	240,633	6,360
Period 2a Additional Costs																					
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,620	486	2,106	2,106	-	-	-	-	-	-	-	-	30,695	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	1,620	486	2,106	2,106	-	-	-	-	-	-	-	-	30,695	-
Period 2a Collateral Costs																					
2a.3.1	Process decommissioning water waste	72	-	48	211	-	191	-	120	641	641	-	-	-	460	-	-	-	27,582	90	-
2a.3.2	Process decommissioning chemical flush waste	0	-	15	85	-	109	-	42	250	250	-	-	-	148	-	-	-	15,794	28	-
2a.3.3	Small tool allowance	-	225	-	-	-	-	-	34	259	233	-	26	-	-	-	-	-	-	-	-
2a.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,786	1,168	8,953	-	8,953	-	-	-	-	-	-	-	-	-
2a.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	119	12	131	131	-	-	-	-	-	-	-	-	-	-
2a.3.6	Fixed Overhead	-	-	-	-	-	-	2,629	394	3,023	3,023	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	72	225	62	296	-	300	10,534	1,769	13,258	4,278	8,953	26	-	608	-	-	-	43,375	117	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	83	-	-	-	-	-	-	21	104	104	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	870	87	957	957	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	21	2	23	21	-	2	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,865	-	-	-	-	-	466	2,331	2,331	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	3,758	-	-	-	-	-	564	4,322	4,322	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	74	24	-	250	-	74	422	422	-	-	3,511	-	-	-	-	70,215	115	-
2a.4.7	Plant energy budget	-	-	-	-	-	-	4,097	615	4,712	4,712	-	-	-	-	-	-	-	-	-	-

Table C-1  
Turkey Point Nuclear Plant, Unit 3  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed	Burial Volumes				Burial /	Craft Manhours	Utility and
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		Contractor Manhours
Period 2a Period-Dependent Costs (continued)																					
2a.4.8	NRC Fees	-	-	-	-	-	-	920	92	1,012	1,012	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	677	68	745	-	745	-	-	-	-	-	-	-	-	-
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,177	177	1,354	-	1,354	-	-	-	-	-	-	-	-	-
2a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	72	11	83	-	83	-	-	-	-	-	-	-	-	-
2a.4.12	NEI Fees	-	-	-	-	-	-	535	54	589	589	-	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	9,638	1,446	11,084	11,084	-	-	-	-	-	-	-	-	-	186,340
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	20,084	3,013	23,097	23,097	-	-	-	-	-	-	-	-	-	234,080
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	33,567	5,035	38,602	38,602	-	-	-	-	-	-	-	-	-	433,171
2a.4	Subtotal Period 2a Period-Dependent Costs	83	5,623	74	24	-	250	71,659	11,722	89,435	87,250	2,182	2	-	3,511	-	-	-	70,215	115	853,591
2a.0	TOTAL PERIOD 2a COST	1,122	25,221	16,975	13,091	2,912	27,965	84,431	39,646	211,363	196,109	11,135	4,118	46,653	59,647	587	842	-	7,468,457	271,560	859,951
<b>PERIOD 2b - Site Decontamination</b>																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	Containment Emergency Filter	-	5	0	0	3	0	-	2	11	11	-	-	45	2	-	-	-	1,945	111	-
2b.1.1.2	Containment Normal & Emerg Cooling	-	591	18	54	492	77	-	251	1,484	1,484	-	-	7,004	325	-	-	-	305,947	10,773	-
2b.1.1.3	Containment Normal & Emerg Cooling - Ins	-	5	1	1	0	4	-	2	13	13	-	-	3	18	-	-	-	1,341	80	-
2b.1.1.4	Containment Purge	-	49	5	10	51	41	-	32	189	189	-	-	729	175	-	-	-	41,193	970	-
2b.1.1.5	Containment Spray	-	75	11	15	9	112	-	52	274	274	-	-	134	474	-	-	-	36,791	1,481	-
2b.1.1.6	Containment Spray - Insulated	-	59	7	9	3	66	-	34	178	178	-	-	44	280	-	-	-	20,356	1,136	-
2b.1.1.7	EDG Building HVAC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	39	-
2b.1.1.8	Electrical - Decontaminated	-	2,046	106	198	599	1,097	-	916	4,962	4,962	-	-	8,520	4,664	-	-	-	654,264	39,884	-
2b.1.1.9	Emergency Diesel Engine & Oil	-	68	-	-	-	-	-	10	78	-	-	78	-	-	-	-	-	-	1,507	-
2b.1.1.10	Emergency Diesel Engine & Oil - Ins	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	62	-
2b.1.1.11	Fire Protection - RCA	-	104	9	11	16	72	-	49	261	261	-	-	232	305	-	-	-	29,657	1,909	-
2b.1.1.12	Instrument Air - Insulated - RCA	-	70	3	5	7	31	-	27	142	142	-	-	100	130	-	-	-	12,671	1,410	-
2b.1.1.13	Instrument Air - RCA	-	41	2	3	4	19	-	16	86	86	-	-	63	83	-	-	-	8,032	816	-
2b.1.1.14	Miscellaneous - RCA	-	7	1	2	11	9	-	6	35	35	-	-	155	37	-	-	-	8,715	144	-
2b.1.1.15	Primary Water Makeup	-	76	-	-	-	-	-	11	88	-	-	88	-	-	-	-	-	-	1,691	-
2b.1.1.16	Refueling Equipment	-	140	13	22	49	133	-	80	438	438	-	-	700	566	-	-	-	65,832	2,951	-
2b.1.1.17	Residual Heat Removal	187	82	81	109	104	758	-	344	1,665	1,665	-	-	1,485	3,214	-	-	-	273,112	1,994	-
2b.1.1.18	Residual Heat Removal - Insulated	259	250	41	58	54	407	-	315	1,384	1,384	-	-	769	1,729	-	-	-	145,621	6,737	-
2b.1.1.19	Safety Injection Accumulator	-	227	16	33	189	119	-	121	704	704	-	-	2,687	506	-	-	-	142,448	4,560	-
2b.1.1.20	Service Water	-	0	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	10	-
2b.1.1.21	Service Water - RCA	-	4	0	1	2	3	-	2	12	12	-	-	27	13	-	-	-	1,926	83	-
2b.1.1.22	Steam Generator Wet Layup	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	25	-
2b.1.1.23	Steam Generator Wet Layup - RCA	-	2	0	0	0	1	-	1	4	4	-	-	2	5	-	-	-	455	28	-
2b.1.1.24	Waste Disposal	20	39	4	5	5	31	-	29	132	132	-	-	65	134	-	-	-	11,438	1,130	-
2b.1.1.25	Waste Disposal - Insulated	58	84	7	10	4	70	-	70	302	302	-	-	54	296	-	-	-	21,829	2,596	-
2b.1.1	Totals	524	4,030	327	545	1,603	3,051	-	2,372	12,451	12,278	-	172	22,817	12,955	-	-	-	1,783,573	82,129	-
2b.1.2	Scaffolding in support of decommissioning	-	222	4	2	14	4	-	59	305	305	-	-	183	16	-	-	-	9,299	5,423	-
Decontamination of Site Buildings																					
2b.1.3.1	Containment	859	1,084	49	637	158	1,223	-	1,130	5,140	5,140	-	-	2,253	15,142	-	-	-	1,295,734	36,308	-
2b.1.3.2	LLW Storage Area Soil Disposal	-	108	214	3,699	-	4,933	-	1,837	10,791	10,791	-	-	-	81,327	-	-	-	7,047,000	1,548	-
2b.1.3	Totals	859	1,192	263	4,336	158	6,156	-	2,967	15,931	15,931	-	-	2,253	96,469	-	-	-	8,342,734	37,856	-
2b.1	Subtotal Period 2b Activity Costs	1,383	5,443	594	4,883	1,776	9,211	-	5,398	28,687	28,514	-	172	25,253	109,441	-	-	-	10,135,610	125,407	-
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,762	829	3,590	3,590	-	-	-	-	-	-	-	-	52,336	-
2b.2.2	Seaweed Remediation & Disposal	-	45	1	374	-	415	-	171	1,008	1,008	-	-	-	29,650	-	-	-	593,000	494	-
2b.2	Subtotal Period 2b Additional Costs	-	45	1	374	-	415	2,762	1,000	4,598	4,598	-	-	-	29,650	-	-	-	593,000	52,830	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	50	-	35	153	-	138	-	86	462	462	-	-	-	333	-	-	-	19,997	65	-
2b.3.2	Process decommissioning chemical flush waste	3	-	105	601	-	776	-	296	1,780	1,780	-	-	-	1,054	-	-	-	112,266	197	-
2b.3.3	Small tool allowance	-	98	-	-	-	-	-	15	113	113	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	45,085	6,763	51,847	-	51,847	-	-	-	-	-	-	-	-	-

Table C-1  
Turkey Point Nuclear Plant, Unit 3  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2b Collateral Costs (continued)																						
2b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	279	28	307	307	-	-	-	-	-	-	-	-	-	-	
2b.3.6	Fixed Overhead	-	-	-	-	-	-	4,482	672	5,155	5,155	-	-	-	-	-	-	-	-	-	-	
2b.3	Subtotal Period 2b Collateral Costs	53	98	140	754	-	914	49,846	7,860	59,665	7,817	51,847	-	-	1,387	-	-	-	-	132,264	262	-
Period 2b Period-Dependent Costs																						
2b.4.1	Decon supplies	455	-	-	-	-	-	-	114	569	569	-	-	-	-	-	-	-	-	-	-	
2b.4.2	Insurance	-	-	-	-	-	-	1,482	148	1,630	1,630	-	-	-	-	-	-	-	-	-	-	
2b.4.3	Property taxes	-	-	-	-	-	-	36	4	40	40	-	-	-	-	-	-	-	-	-	-	
2b.4.4	Health physics supplies	-	1,728	-	-	-	-	-	432	2,160	2,160	-	-	-	-	-	-	-	-	-	-	
2b.4.5	Heavy equipment rental	-	6,579	-	-	-	-	-	987	7,566	7,566	-	-	-	-	-	-	-	-	-	-	
2b.4.6	Disposal of DAW generated	-	-	58	19	-	198	-	58	334	334	-	-	-	2,783	-	-	-	-	55,664	91	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	5,515	827	6,342	6,342	-	-	-	-	-	-	-	-	-	-	
2b.4.8	NRC Fees	-	-	-	-	-	-	1,569	157	1,726	1,726	-	-	-	-	-	-	-	-	-	-	
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,154	115	1,270	-	1,270	-	-	-	-	-	-	-	-	-	
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	2,008	301	2,309	-	2,309	-	-	-	-	-	-	-	-	-	
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	508	76	584	584	-	-	-	-	-	-	-	-	-	-	
2b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	123	18	142	-	142	-	-	-	-	-	-	-	-	-	
2b.4.13	NEI Fees	-	-	-	-	-	-	912	91	1,004	1,004	-	-	-	-	-	-	-	-	-	-	
2b.4.14	Security Staff Cost	-	-	-	-	-	-	16,433	2,465	18,898	18,898	-	-	-	-	-	-	-	-	-	-	
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	23,669	3,550	27,219	27,219	-	-	-	-	-	-	-	-	-	-	
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	39,698	5,955	45,653	45,653	-	-	-	-	-	-	-	-	-	-	
2b.4	Subtotal Period 2b Period-Dependent Costs	455	8,307	58	19	-	198	93,108	15,299	117,445	113,725	3,720	-	-	2,783	-	-	-	-	55,664	91	1,129,057
2b.0	TOTAL PERIOD 2b COST	1,891	13,893	793	6,030	1,776	10,738	145,716	29,557	210,394	154,654	55,568	172	25,253	143,261	-	-	-	-	10,916,530	178,590	1,129,057
<b>PERIOD 2d - Decontamination Following Wet Fuel Storage</b>																						
Period 2d Direct Decommissioning Activities																						
2d.1.1	Remove spent fuel racks	423	42	161	115	-	874	-	474	2,088	2,088	-	-	-	3,714	-	-	-	-	245,474	1,023	-
Disposal of Plant Systems																						
2d.1.2.1	Electrical - Contaminated	-	227	4	12	111	14	-	79	445	445	-	-	1,574	59	-	-	-	-	67,822	4,405	-
2d.1.2.2	Fuel Handling HVAC	-	56	2	5	47	6	-	23	138	138	-	-	662	25	-	-	-	-	28,530	1,047	-
2d.1.2.3	Spent Fuel Pool Cooling	73	109	15	21	16	148	-	108	489	489	-	-	231	630	-	-	-	-	51,027	3,066	-
2d.1.2.4	Spent Fuel Pool Cooling - Insulated	43	52	6	8	5	58	-	51	223	223	-	-	68	246	-	-	-	-	19,021	1,571	-
2d.1.2	Totals	115	443	26	46	178	226	-	261	1,295	1,295	-	-	2,534	960	-	-	-	-	166,400	10,089	-
Decontamination of Site Buildings																						
2d.1.3.1	Fuel Handling	334	396	4	20	92	27	-	290	1,162	1,162	-	-	1,306	298	-	-	-	-	77,447	14,581	-
2d.1.3	Totals	334	396	4	20	92	27	-	290	1,162	1,162	-	-	1,306	298	-	-	-	-	77,447	14,581	-
2d.1.4	Scaffolding in support of decommissioning	-	44	1	0	3	1	-	12	61	61	-	-	37	3	-	-	-	-	1,860	1,085	-
2d.1	Subtotal Period 2d Activity Costs	872	925	192	181	273	1,127	-	1,036	4,606	4,606	-	-	3,877	4,975	-	-	-	-	491,181	26,777	-
Period 2d Additional Costs																						
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,098	330	1,428	1,428	-	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	598	179	777	777	-	-	-	-	-	-	-	-	-	11,333	-
2d.2	Subtotal Period 2d Additional Costs	-	-	-	-	-	-	1,696	509	2,205	2,205	-	-	-	-	-	-	-	-	-	11,333	6,240
Period 2d Collateral Costs																						
2d.3.1	Process decommissioning water waste	58	-	40	178	-	161	-	100	537	537	-	-	-	387	-	-	-	-	23,234	75	-
2d.3.2	Process decommissioning chemical flush waste	0	-	14	78	-	100	-	38	230	230	-	-	-	136	-	-	-	-	14,486	25	-
2d.3.3	Small tool allowance	-	28	-	-	-	-	-	4	33	33	-	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	138	68	467	124	-	125	923	923	-	-	6,000	529	-	-	-	-	304,968	88	-
2d.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	13	1	14	14	-	-	-	-	-	-	-	-	-	-	-
2d.3.6	Fixed Overhead	-	-	-	-	-	-	971	146	1,116	1,116	-	-	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	59	28	192	323	467	385	984	414	2,852	2,852	-	-	6,000	1,052	-	-	-	-	342,688	189	-
Period 2d Period-Dependent Costs																						
2d.4.1	Decon supplies	79	-	-	-	-	-	-	20	99	99	-	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	321	32	353	353	-	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	8	1	9	9	-	-	-	-	-	-	-	-	-	-	-

**Table C-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2d Period-Dependent Costs (continued)																						
2d.4.4	Health physics supplies	-	347	-	-	-	-	-	87	434	434	-	-	-	-	-	-	-	-	-	-	
2d.4.5	Heavy equipment rental	-	1,425	-	-	-	-	-	214	1,638	1,638	-	-	-	-	-	-	-	-	-	-	
2d.4.6	Disposal of DAW generated	-	-	14	5	-	46	-	14	78	78	-	-	-	651	-	-	-	-	13,027	21	
2d.4.7	Plant energy budget	-	-	-	-	-	-	637	96	732	732	-	-	-	-	-	-	-	-	-	-	
2d.4.8	NRC Fees	-	-	-	-	-	-	291	29	320	320	-	-	-	-	-	-	-	-	-	-	
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	250	25	275	-	275	-	-	-	-	-	-	-	-	-	
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	220	33	253	253	-	-	-	-	-	-	-	-	-	-	
2d.4.11	ISFSI Operating Costs	-	-	-	-	-	-	27	4	31	-	31	-	-	-	-	-	-	-	-	-	
2d.4.12	NEI Fees	-	-	-	-	-	-	198	20	217	217	-	-	-	-	-	-	-	-	-	-	
2d.4.13	Security Staff Cost	-	-	-	-	-	-	1,237	185	1,422	1,422	-	-	-	-	-	-	-	-	-	23,880	
2d.4.14	DOC Staff Cost	-	-	-	-	-	-	3,409	511	3,920	3,920	-	-	-	-	-	-	-	-	-	41,506	
2d.4.15	Utility Staff Cost	-	-	-	-	-	-	5,001	750	5,752	5,752	-	-	-	-	-	-	-	-	-	68,797	
2d.4	Subtotal Period 2d Period-Dependent Costs	79	1,772	14	5	-	46	11,598	2,020	15,533	15,228	306	-	-	651	-	-	-	-	13,027	21	134,183
2d.0	TOTAL PERIOD 2d COST	1,010	2,725	398	508	740	1,559	14,278	3,980	25,197	24,891	306	-	9,877	6,678	-	-	-	-	846,896	38,321	140,423
<b>PERIOD 2e - Delay before License Termination</b>																						
Period 2e Direct Decommissioning Activities																						
Period 2e Collateral Costs																						
2e.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	584	88	671	-	671	-	-	-	-	-	-	-	-	-	
2e.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	
2e.3.3	Fixed Overhead	-	-	-	-	-	-	1,424	214	1,638	1,638	-	-	-	-	-	-	-	-	-	-	
2e.3	Subtotal Period 2e Collateral Costs	-	-	-	-	-	-	2,008	301	2,309	1,638	671	-	-	-	-	-	-	-	-	-	
Period 2e Period-Dependent Costs																						
2e.4.1	Insurance	-	-	-	-	-	-	471	47	518	518	-	-	-	-	-	-	-	-	-	-	
2e.4.2	Property taxes	-	-	-	-	-	-	12	1	13	13	-	-	-	-	-	-	-	-	-	-	
2e.4.3	Health physics supplies	-	51	-	-	-	-	-	13	63	63	-	-	-	-	-	-	-	-	-	-	
2e.4.4	Disposal of DAW generated	-	-	1	0	-	4	-	1	7	7	-	-	-	56	-	-	-	-	1,128	2	
2e.4.6	NRC Fees	-	-	-	-	-	-	212	21	234	234	-	-	-	-	-	-	-	-	-	-	
2e.4.7	Emergency Planning Fees	-	-	-	-	-	-	367	37	403	-	403	-	-	-	-	-	-	-	-	-	
2e.4.8	ISFSI Operating Costs	-	-	-	-	-	-	39	6	45	-	45	-	-	-	-	-	-	-	-	-	
2e.4.9	NEI Fees	-	-	-	-	-	-	290	29	319	319	-	-	-	-	-	-	-	-	-	-	
2e.4.10	Security Staff Cost	-	-	-	-	-	-	1,814	272	2,087	2,087	-	-	-	-	-	-	-	-	-	35,040	
2e.4.11	Utility Staff Cost	-	-	-	-	-	-	865	130	994	994	-	-	-	-	-	-	-	-	-	11,680	
2e.4	Subtotal Period 2e Period-Dependent Costs	-	51	1	0	-	4	4,070	557	4,683	4,234	448	-	-	56	-	-	-	-	1,128	2	46,720
2e.0	TOTAL PERIOD 2e COST	-	51	1	0	-	4	6,078	858	6,992	5,872	1,120	-	-	56	-	-	-	-	1,128	2	46,720
<b>PERIOD 2f - License Termination</b>																						
Period 2f Direct Decommissioning Activities																						
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	162	49	210	210	-	-	-	-	-	-	-	-	-	-	
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	162	49	210	210	-	-	-	-	-	-	-	-	-	-	
Period 2f Additional Costs																						
2f.2.1	License Termination Survey	-	-	-	-	-	-	2,665	799	3,464	3,464	-	-	-	-	-	-	-	-	-	42,348	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	2,665	799	3,464	3,464	-	-	-	-	-	-	-	-	-	42,348	3,120
Period 2f Collateral Costs																						
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,549	232	1,781	1,781	-	-	-	-	-	-	-	-	-	-	
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,064	160	1,223	-	1,223	-	-	-	-	-	-	-	-	-	
2f.3.3	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	-	
2f.3.4	Fixed Overhead	-	-	-	-	-	-	1,346	202	1,548	1,548	-	-	-	-	-	-	-	-	-	-	
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	3,959	594	4,553	3,329	1,223	-	-	-	-	-	-	-	-	-	
Period 2f Period-Dependent Costs																						
2f.4.1	Insurance	-	-	-	-	-	-	445	45	490	490	-	-	-	-	-	-	-	-	-	-	
2f.4.2	Property taxes	-	-	-	-	-	-	11	1	12	12	-	-	-	-	-	-	-	-	-	-	
2f.4.3	Health physics supplies	-	337	-	-	-	-	-	84	421	421	-	-	-	-	-	-	-	-	-	-	

Table C-1  
Turkey Point Nuclear Plant, Unit 3  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours		
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet					
Period 2f Period-Dependent Costs (continued)																							
2f.4.4	Disposal of DAW generated	-	-	5	2	-	18	-	5	30	30	-	-	-	250	-	-	-	-	4,992	8	-	
2f.4.5	Plant energy budget	-	-	-	-	-	-	442	66	508	508	-	-	-	-	-	-	-	-	-	-	-	
2f.4.6	NRC Fees	-	-	-	-	-	-	456	46	501	501	-	-	-	-	-	-	-	-	-	-	-	
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	347	35	381	-	381	-	-	-	-	-	-	-	-	-	-	
2f.4.8	ISFSI Operating Costs	-	-	-	-	-	-	37	6	43	-	43	-	-	-	-	-	-	-	-	-	-	
2f.4.9	NEI Fees	-	-	-	-	-	-	274	27	301	301	-	-	-	-	-	-	-	-	-	-	-	
2f.4.10	Security Staff Cost	-	-	-	-	-	-	1,619	243	1,862	1,862	-	-	-	-	-	-	-	-	-	-	33,120	
2f.4.11	DOC Staff Cost	-	-	-	-	-	-	3,896	584	4,480	4,480	-	-	-	-	-	-	-	-	-	-	46,920	
2f.4.12	Utility Staff Cost	-	-	-	-	-	-	5,094	764	5,859	5,859	-	-	-	-	-	-	-	-	-	-	60,326	
2f.4	Subtotal Period 2f Period-Dependent Costs	-	337	5	2	-	18	12,620	1,906	14,888	14,464	424	-	-	250	-	-	-	-	4,992	8	140,366	
2f.0	TOTAL PERIOD 2f COST	-	337	5	2	-	18	19,405	3,348	23,115	21,468	1,647	-	-	250	-	-	-	-	4,992	42,356	143,486	
<b>PERIOD 2 TOTALS</b>		4,022	42,228	18,173	19,631	5,427	40,283	269,908	77,388	477,060	402,994	69,775	4,291	81,783	209,891	587	842	-	19,238,000	530,829	2,319,637		
<b>PERIOD 3b - Site Restoration</b>																							
Period 3b Direct Decommissioning Activities																							
Demolition of Remaining Site Buildings																							
3b.1.1.1	Containment	-	4,220	-	-	-	-	-	633	4,853	-	-	4,853	-	-	-	-	-	-	-	-	47,090	-
3b.1.1.2	Miscellaneous Structures	-	188	-	-	-	-	-	28	216	-	-	216	-	-	-	-	-	-	-	-	2,629	-
3b.1.1.3	Sealwell	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	-	-	1,251	-
3b.1.1.4	Security Improvements	-	305	-	-	-	-	-	46	351	-	-	351	-	-	-	-	-	-	-	-	2,380	-
3b.1.1.5	Turbine	-	440	-	-	-	-	-	66	506	-	-	506	-	-	-	-	-	-	-	-	6,821	-
3b.1.1.6	Turbine Pedestal	-	488	-	-	-	-	-	73	561	-	-	561	-	-	-	-	-	-	-	-	5,055	-
3b.1.1.7	Fuel Handling	-	527	-	-	-	-	-	79	606	-	-	606	-	-	-	-	-	-	-	-	6,475	-
3b.1.1	Totals	-	6,271	-	-	-	-	-	941	7,211	-	-	7,211	-	-	-	-	-	-	-	-	71,701	-
Site Closeout Activities																							
3b.1.2	Grade & landscape site	-	421	-	-	-	-	-	63	484	-	-	484	-	-	-	-	-	-	-	-	921	-
3b.1.3	Final report to NRC	-	-	-	-	-	-	198	30	228	228	-	-	-	-	-	-	-	-	-	-	1,560	-
3b.1	Subtotal Period 3b Activity Costs	-	6,691	-	-	-	-	198	1,033	7,923	228	-	7,695	-	-	-	-	-	-	-	-	72,622	1,560
Period 3b Additional Costs																							
3b.2.1	Concrete Crushing	-	234	-	-	-	-	3	36	273	-	-	273	-	-	-	-	-	-	-	-	1,158	-
3b.2	Subtotal Period 3b Additional Costs	-	234	-	-	-	-	3	36	273	-	-	273	-	-	-	-	-	-	-	-	1,158	-
Period 3b Collateral Costs																							
3b.3.1	Small tool allowance	-	60	-	-	-	-	-	9	69	-	-	69	-	-	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,885	283	2,168	-	2,168	-	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	60	-	-	-	-	1,885	292	2,237	-	2,168	69	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																							
3b.4.1	Insurance	-	-	-	-	-	-	640	64	704	-	704	-	-	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	28	3	30	-	30	-	-	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,855	-	-	-	-	-	1,028	7,883	-	-	7,883	-	-	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	557	84	640	-	-	640	-	-	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	353	35	389	-	389	-	-	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	874	87	962	-	962	-	-	-	-	-	-	-	-	-	-	-
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	93	14	107	-	107	-	-	-	-	-	-	-	-	-	-	-
3b.4.8	Security Staff Cost	-	-	-	-	-	-	4,082	612	4,694	-	3,521	1,174	-	-	-	-	-	-	-	-	-	83,520
3b.4.9	DOC Staff Cost	-	-	-	-	-	-	9,488	1,423	10,911	-	-	10,911	-	-	-	-	-	-	-	-	-	105,394
3b.4.10	Utility Staff Cost	-	-	-	-	-	-	5,645	847	6,492	(0)	1,233	5,259	-	-	-	-	-	-	-	-	-	67,134
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,855	-	-	-	-	21,761	4,198	32,813	(0)	6,947	25,867	-	-	-	-	-	-	-	-	-	256,048
3b.0	TOTAL PERIOD 3b COST	-	13,840	-	-	-	-	23,848	5,558	43,247	228	9,115	33,904	-	-	-	-	-	-	-	-	73,780	257,608
<b>PERIOD 3c - Fuel Storage Operations/Shipping</b>																							
Period 3c Collateral Costs																							
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	20,083	3,012	23,095	-	23,095	-	-	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	20,083	3,012	23,095	-	23,095	-	-	-	-	-	-	-	-	-	-	-

Table C-1  
Turkey Point Nuclear Plant, Unit 3  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 3c Period-Dependent Costs																						
3c.4.1	Insurance	-	-	-	-	-	-	10,428	1,043	11,470	-	11,470	-	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	447	45	491	-	491	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	5,734	573	6,308	-	6,308	-	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	14,181	1,418	15,599	-	15,599	-	-	-	-	-	-	-	-	-	-
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,514	227	1,741	-	1,741	-	-	-	-	-	-	-	-	-	-
3c.4.7	Security Staff Cost	-	-	-	-	-	-	49,779	7,467	57,246	-	57,246	-	-	-	-	-	-	-	-	-	1,000,060
3c.4.8	Utility Staff Cost	-	-	-	-	-	-	17,851	2,678	20,529	-	20,529	-	-	-	-	-	-	-	-	-	218,078
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	99,934	13,451	113,385	-	113,385	-	-	-	-	-	-	-	-	-	1,218,138
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	120,017	16,463	136,480	-	136,480	-	-	-	-	-	-	-	-	-	1,218,138
<b>PERIOD 3d - GTCC shipping</b>																						
Period 3d Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	982	-	-	13,033	-	2,200	16,214	16,214	-	-	-	-	-	-	-	2,061	407,628	-	-
3d.1.1	Totals	-	-	982	-	-	13,033	-	2,200	16,214	16,214	-	-	-	-	-	-	-	2,061	407,628	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	982	-	-	13,033	-	2,200	16,214	16,214	-	-	-	-	-	-	-	2,061	407,628	-	-
Period 3d Collateral Costs																						
3d.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	4	0	4	-	4	-	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	4	0	4	-	4	-	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																						
3d.4.1	Insurance	-	-	-	-	-	-	17	2	18	-	18	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	1	0	1	-	1	-	-	-	-	-	-	-	-	-	-
3d.4.4	Emergency Planning Fees	-	-	-	-	-	-	18	2	19	-	19	-	-	-	-	-	-	-	-	-	-
3d.4.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-	-
3d.4.6	Security Staff Cost	-	-	-	-	-	-	62	9	71	-	71	-	-	-	-	-	-	-	-	-	1,240
3d.4.7	Utility Staff Cost	-	-	-	-	-	-	22	3	25	-	25	-	-	-	-	-	-	-	-	-	270
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	121	16	137	-	137	-	-	-	-	-	-	-	-	-	1,510
3d.0	TOTAL PERIOD 3d COST	-	-	982	-	-	13,033	125	2,217	16,356	16,214	141	-	-	-	-	-	-	2,061	407,628	-	1,510
<b>PERIOD 3e - ISFSI Decontamination</b>																						
Period 3e Direct Decommissioning Activities																						
Period 3e Additional Costs																						
3e.2.1	Decommissioning of ISFSI	-	317	2	492	-	726	1,137	669	3,343	3,343	-	-	-	10,693	-	-	-	-	1,561,386	10,512	996
3e.2	Subtotal Period 3e Additional Costs	-	317	2	492	-	726	1,137	669	3,343	3,343	-	-	-	10,693	-	-	-	-	1,561,386	10,512	996
Period 3e Collateral Costs																						
3e.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	21	5	26	26	-	-	-	-	-	-	-	-	-	-	-
3e.3	Subtotal Period 3e Collateral Costs	-	-	-	-	-	-	21	5	26	26	-	-	-	-	-	-	-	-	-	-	-
Period 3e Period-Dependent Costs																						
3e.4.1	Insurance	-	-	-	-	-	-	34	8	42	42	-	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	-	-
3e.4.3	Plant energy budget	-	-	-	-	-	-	97	24	121	121	-	-	-	-	-	-	-	-	-	-	-
3e.4.4	Security Staff Cost	-	-	-	-	-	-	77	19	96	96	-	-	-	-	-	-	-	-	-	-	1,729
3e.4.5	Utility Staff Cost	-	-	-	-	-	-	163	41	204	204	-	-	-	-	-	-	-	-	-	-	1,901
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	375	94	469	469	-	-	-	-	-	-	-	-	-	-	3,630
3e.0	TOTAL PERIOD 3e COST	-	317	2	492	-	726	1,533	768	3,838	3,838	-	-	-	10,693	-	-	-	-	1,561,386	10,512	4,626
<b>PERIOD 3f - ISFSI Site Restoration</b>																						
Period 3f Direct Decommissioning Activities																						
Period 3f Additional Costs																						
3f.2.1	Demolition of ISFSI	-	594	-	-	-	-	28	93	715	-	-	715	-	-	-	-	-	-	-	3,106	80

**Table C-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial/ Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
3f.2	Subtotal Period 3f Additional Costs	-	594	-	-	-	-	28	93	715	-	-	715	-	-	-	-	-	-	-	3,106	80
Period 3f Collateral Costs																						
3f.3.1	Small tool allowance	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																						
3f.4.2	Property taxes	-	-	-	-	-	-	2	0	3	-	-	3	-	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	49	7	56	-	-	56	-	-	-	-	-	-	-	-	-
3f.4.5	Security Staff Cost	-	-	-	-	-	-	15	2	18	-	-	18	-	-	-	-	-	-	-	-	349
3f.4.6	Utility Staff Cost	-	-	-	-	-	-	71	11	81	-	-	81	-	-	-	-	-	-	-	-	784
3f.4	Subtotal Period 3f Period-Dependent Costs	-	15	-	-	-	-	137	23	175	-	-	175	-	-	-	-	-	-	-	-	1,133
3f.0	TOTAL PERIOD 3f COST	-	614	-	-	-	-	166	117	897	-	-	897	-	-	-	-	-	-	-	3,106	1,213
<b>PERIOD 3 TOTALS</b>		-	14,772	984	492	-	13,758	145,688	25,123	200,816	20,280	145,736	34,800	-	10,693	-	-	2,061	1,969,014	87,398	1,483,095	
<b>TOTAL COST TO DECOMMISSION</b>		<b>7,188</b>	<b>63,465</b>	<b>19,871</b>	<b>21,005</b>	<b>10,375</b>	<b>58,122</b>	<b>540,224</b>	<b>125,786</b>	<b>846,034</b>	<b>580,783</b>	<b>224,586</b>	<b>40,665</b>	<b>105,115</b>	<b>234,349</b>	<b>1,233</b>	<b>842</b>	<b>2,061</b>	<b>22,702,120</b>	<b>693,162</b>	<b>4,845,694</b>	

<b>TOTAL COST TO DECOMMISSION WITH 17.46% CONTINGENCY:</b>	<b>\$846,034</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL NRC LICENSE TERMINATION COST IS 68.65% OR:</b>	<b>\$580,783</b>	<b>thousands of 2015 dollars</b>
<b>SPENT FUEL MANAGEMENT COST IS 26.55% OR:</b>	<b>\$224,586</b>	<b>thousands of 2015 dollars</b>
<b>NON-NUCLEAR DEMOLITION COST IS 4.81% OR:</b>	<b>\$40,665</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):</b>	<b>236,423</b>	<b>cubic feet</b>
<b>TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:</b>	<b>2,061</b>	<b>cubic feet</b>
<b>TOTAL SCRAP METAL REMOVED:</b>	<b>32,364</b>	<b>tons</b>
<b>TOTAL CRAFT LABOR REQUIREMENTS:</b>	<b>693,162</b>	<b>man-hours</b>

End Notes:  
n/a - indicates that this activity not charged as decommissioning expense.  
a - indicates that this activity performed by decommissioning staff.  
0 - indicates that this value is less than 0.5 but is non-zero.  
a cell containing " - " indicates a zero value

Table C-2  
Turkey Point Nuclear Plant, Unit 4  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
<b>PERIOD 1a - Shutdown through Transition</b>																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	556
1a.1.2	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.3	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-
1a.1.4	Notification of Permanent Defueling	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.5	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	109	16	125	125	-	-	-	-	-	-	-	-	-	856
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	1,969
1a.1.8	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1a.1.10	End product description	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	556
1a.1.12	Define major work sequence	-	-	-	-	-	-	408	61	469	469	-	-	-	-	-	-	-	-	-	3,210
1a.1.13	Perform SER and EA	-	-	-	-	-	-	169	25	194	194	-	-	-	-	-	-	-	-	-	1,327
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	2,140
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	223	33	256	256	-	-	-	-	-	-	-	-	-	1,753
1a.1.16	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	268	40	308	277	-	31	-	-	-	-	-	-	-	2,106
1a.1.17.2	Plant systems	-	-	-	-	-	-	227	34	261	235	-	26	-	-	-	-	-	-	-	1,783
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	27	4	31	31	-	-	-	-	-	-	-	-	-	214
1a.1.17.4	Reactor internals	-	-	-	-	-	-	386	58	444	444	-	-	-	-	-	-	-	-	-	3,039
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	353	53	406	406	-	-	-	-	-	-	-	-	-	2,782
1a.1.17.6	Biological shield	-	-	-	-	-	-	27	4	31	31	-	-	-	-	-	-	-	-	-	214
1a.1.17.7	Steam generators	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,335
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	87	13	100	50	-	50	-	-	-	-	-	-	-	685
1a.1.17.9	Main Turbine	-	-	-	-	-	-	22	3	25	-	-	25	-	-	-	-	-	-	-	171
1a.1.17.10	Main Condensers	-	-	-	-	-	-	22	3	25	-	-	25	-	-	-	-	-	-	-	171
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	170	25	195	98	-	98	-	-	-	-	-	-	-	1,335
1a.1.17.12	Waste management	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	1,969
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	49	7	56	28	-	28	-	-	-	-	-	-	-	385
1a.1.17	Total	-	-	-	-	-	-	2,057	309	2,365	2,083	-	283	-	-	-	-	-	-	-	16,190
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,027
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	3,100	465	3,565	3,565	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	76	11	88	88	-	-	-	-	-	-	-	-	-	599
1a.1.21	Rigging/Cont. Cntrl Envlp/ooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	67	10	77	77	-	-	-	-	-	-	-	-	-	526
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	9,410	1,412	10,822	10,539	-	283	-	-	-	-	-	-	-	31,566
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,128	169	1,297	-	1,297	-	-	-	-	-	-	-	-	-
1a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
1a.3.3	Fixed Overhead	-	-	-	-	-	-	1,780	267	2,047	2,047	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,909	436	3,346	2,048	1,297	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,271	127	1,398	1,398	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	408	41	448	448	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	394	-	-	-	-	-	99	493	493	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	706	-	-	-	-	-	106	812	812	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	10	3	-	35	-	10	59	59	-	-	493	-	-	-	-	9,854	16	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,920	438	3,358	3,358	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	823	82	905	905	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	667	67	734	-	734	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	797	120	917	-	917	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	-
1a.4.11	INPO Fees	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	-
1a.4.12	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-

Table C-2  
Turkey Point Nuclear Plant, Unit 4  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 1a Period-Dependent Costs (continued)																						
1a.4.13	Security Staff Cost	-	-	-	-	-	-	6,527	979	7,506	7,506	-	-	-	-	-	-	-	-	-	-	126,186
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	31,842	4,776	36,618	36,618	-	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,100	10	3	-	35	46,506	6,972	54,627	52,920	1,707	-	-	493	-	-	-	-	9,854	16	549,586
1a.0	TOTAL PERIOD 1a COST	-	1,100	10	3	-	35	58,825	8,820	68,795	65,508	3,004	283	-	493	-	-	-	-	9,854	16	581,152
<b>PERIOD 1b - Decommissioning Preparations</b>																						
Period 1b Direct Decommissioning Activities																						
Detailed Work Procedures																						
1b.1.1.1	Plant systems	-	-	-	-	-	-	257	39	296	266	-	30	-	-	-	-	-	-	-	-	2,026
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	-	428
1b.1.1.3	Reactor internals	-	-	-	-	-	-	136	20	156	156	-	-	-	-	-	-	-	-	-	-	1,070
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	73	11	84	21	-	63	-	-	-	-	-	-	-	-	578
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	-	428
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	-	428
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	-	428
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	197	30	227	227	-	-	-	-	-	-	-	-	-	-	1,554
1b.1.1.9	Facility closeout	-	-	-	-	-	-	65	10	75	38	-	38	-	-	-	-	-	-	-	-	514
1b.1.1.10	Missile shields	-	-	-	-	-	-	24	4	28	28	-	-	-	-	-	-	-	-	-	-	193
1b.1.1.11	Biological shield	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	-	514
1b.1.1.12	Steam generators	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	-	1,969
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	54	8	63	31	-	31	-	-	-	-	-	-	-	-	428
1b.1.1.14	Main Turbine	-	-	-	-	-	-	85	13	98	-	-	98	-	-	-	-	-	-	-	-	668
1b.1.1.15	Main Condensers	-	-	-	-	-	-	85	13	98	-	-	98	-	-	-	-	-	-	-	-	668
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	148	22	171	154	-	17	-	-	-	-	-	-	-	-	1,168
1b.1.1.17	Reactor building	-	-	-	-	-	-	148	22	171	154	-	17	-	-	-	-	-	-	-	-	1,168
1b.1.1	Total	-	-	-	-	-	-	1,808	271	2,079	1,688	-	391	-	-	-	-	-	-	-	-	14,228
1b.1.2	Decon primary loop	587	-	-	-	-	-	-	293	880	880	-	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	587	-	-	-	-	-	1,808	564	2,959	2,568	-	391	-	-	-	-	-	-	-	1,067	14,228
Period 1b Additional Costs																						
1b.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,391	1,109	8,500	8,500	-	-	-	-	-	-	-	-	-	-	-
1b.2.2	Site Characterization	-	-	-	-	-	-	2,503	751	3,254	3,254	-	-	-	-	-	-	-	-	-	13,042	4,640
1b.2.3	Misc Hazardous Waste	-	-	611	193	4,947	-	-	832	6,583	6,583	-	-	23,332	-	-	-	-	-	1,232,428	4,905	-
1b.2.4	Asbestos Remediation	-	3,336	2	224	-	1,182	-	1,163	5,908	5,908	-	-	-	12,771	-	-	-	-	166,023	38,278	-
1b.2	Subtotal Period 1b Additional Costs	-	3,336	613	418	4,947	1,182	9,894	3,855	24,245	24,245	-	-	23,332	12,771	-	-	-	-	1,398,451	56,225	4,640
Period 1b Collateral Costs																						
1b.3.1	Decon equipment	918	-	-	-	-	-	-	138	1,056	1,056	-	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,549	232	1,781	1,781	-	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process decommissioning water waste	31	-	20	90	-	81	-	51	273	273	-	-	-	195	-	-	-	-	-	11,725	38
1b.3.4	Process decommissioning chemical flush waste	2	-	64	368	-	2,759	-	752	3,945	3,945	-	-	-	-	646	-	-	-	-	68,816	121
1b.3.5	Small tool allowance	-	39	-	-	-	-	-	6	45	45	-	-	-	-	-	-	-	-	-	-	-
1b.3.6	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-	-
1b.3.7	Decon rig	1,600	-	-	-	-	-	-	240	1,840	1,840	-	-	-	-	-	-	-	-	-	-	-
1b.3.8	Florida LLRW Inspection Fee	-	-	-	-	-	-	27	3	30	30	-	-	-	-	-	-	-	-	-	-	-
1b.3.9	Fixed Overhead	-	-	-	-	-	-	1,180	177	1,357	1,357	-	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	2,551	1,239	85	458	-	2,840	2,756	1,779	11,707	11,707	-	-	-	195	646	-	-	-	80,540	159	-
Period 1b Period-Dependent Costs																						
1b.4.1	Decon supplies	37	-	-	-	-	-	-	9	47	47	-	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	895	89	984	984	-	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	10	1	11	11	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	473	-	-	-	-	-	118	591	591	-	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	468	-	-	-	-	-	70	538	538	-	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	7	2	-	25	-	7	42	42	-	-	-	348	-	-	-	-	6,960	11	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	3,873	581	4,453	4,453	-	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	311	31	342	342	-	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	442	44	486	-	486	-	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	529	79	608	-	608	-	-	-	-	-	-	-	-	-	-

Table C-2  
Turkey Point Nuclear Plant, Unit 4  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed	Burial Volumes				Burial /	Craft Manhours	Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		
Period 1b Period-Dependent Costs (continued)																					
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	32	5	37	-	37	-	-	-	-	-	-	-	-	-
1b.4.12	NEI Fees	-	-	-	-	-	-	240	24	264	264	-	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	4,327	649	4,976	4,976	-	-	-	-	-	-	-	-	-	83,663
1b.4.14	DOC Staff Cost	-	-	-	-	-	-	5,140	771	5,911	5,911	-	-	-	-	-	-	-	-	-	62,229
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	16,793	2,519	19,312	19,312	-	-	-	-	-	-	-	-	-	229,554
1b.4	Subtotal Period 1b Period-Dependent Costs	37	941	7	2	-	25	32,592	4,999	38,603	37,472	1,132	-	-	348	-	-	-	6,960	11	375,446
1b.0	TOTAL PERIOD 1b COST	3,174	5,516	705	878	4,947	4,047	47,050	11,197	77,514	75,991	1,132	391	23,332	13,314	646	-	-	1,485,952	57,462	394,314
<b>PERIOD 1 TOTALS</b>		<b>3,174</b>	<b>6,616</b>	<b>715</b>	<b>882</b>	<b>4,947</b>	<b>4,082</b>	<b>105,875</b>	<b>20,017</b>	<b>146,309</b>	<b>141,499</b>	<b>4,136</b>	<b>674</b>	<b>23,332</b>	<b>13,807</b>	<b>646</b>	<b>-</b>	<b>-</b>	<b>1,495,806</b>	<b>57,478</b>	<b>975,466</b>
<b>PERIOD 2a - Large Component Removal</b>																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	55	44	8	22	-	173	-	86	387	387	-	-	-	425	-	-	-	48,604	1,954	-
2a.1.1.2	Pressurizer Relief Tank	23	20	6	14	-	105	-	46	213	213	-	-	-	265	-	-	-	29,424	863	-
2a.1.1.3	Reactor Coolant Pumps & Motors	45	68	107	154	-	784	-	269	1,428	1,428	-	-	-	2,396	-	-	-	555,300	2,764	100
2a.1.1.4	Pressurizer	36	52	506	109	-	963	-	339	2,004	2,004	-	-	-	2,944	-	-	-	246,802	2,341	938
2a.1.1.5	Steam Generators	234	3,461	1,913	4,263	1,408	4,213	-	3,077	18,569	18,569	-	-	26,258	12,879	-	-	-	2,271,299	11,704	1,750
2a.1.1.6	Retired Steam Generator Units	-	-	685	3,937	-	4,083	-	1,680	10,385	10,385	-	-	-	12,483	-	-	-	1,364,708	2,380	1,125
2a.1.1.7	CRDMs/ICIs/Service Structure Removal	133	222	203	93	-	460	-	271	1,381	1,381	-	-	-	3,474	-	-	-	129,094	7,028	-
2a.1.1.8	Reactor Vessel Internals	86	3,027	10,728	2,012	-	10,447	309	10,768	37,378	37,378	-	-	-	376	587	842	-	223,692	27,283	1,223
2a.1.1.9	Reactor Vessel	90	5,112	2,182	1,645	-	2,603	309	6,184	18,125	18,125	-	-	-	7,746	-	-	-	788,173	27,283	1,223
2a.1.1	Totals	703	12,006	16,337	12,248	1,408	23,831	618	22,720	89,870	89,870	-	-	26,258	42,989	587	842	-	5,657,096	83,602	6,360
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	293	179	148	337	899	-	389	2,246	2,246	-	-	4,333	3,821	-	-	-	447,535	6,108	-
2a.1.3	Main Condensers	-	969	206	171	388	1,033	-	605	3,371	3,371	-	-	4,981	4,392	-	-	-	514,460	20,428	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Containment	-	734	-	-	-	-	-	110	844	844	-	-	-	-	-	-	-	-	-	8,126
2a.1.4.2	Auxiliary	-	122	-	-	-	-	-	18	140	140	-	-	-	-	-	-	-	-	-	1,630
2a.1.4.3	Radwaste Solidification	-	89	-	-	-	-	-	13	102	102	-	-	-	-	-	-	-	-	-	1,099
2a.1.4.4	Fuel Handling	-	56	-	-	-	-	-	8	64	64	-	-	-	-	-	-	-	-	-	663
2a.1.4	Totals	-	1,000	-	-	-	-	-	150	1,150	1,150	-	-	-	-	-	-	-	-	-	11,518
Disposal of Plant Systems																					
2a.1.5.1	Amertap	-	83	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	-	1,847
2a.1.5.2	Auxiliary Feedwater	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	-	352
2a.1.5.3	Auxiliary Feedwater - Insulated	-	28	-	-	-	-	-	4	32	-	-	32	-	-	-	-	-	-	-	623
2a.1.5.4	Auxiliary Feedwater - Insulated - RCA	-	198	10	16	36	98	-	83	441	441	-	-	514	417	-	-	-	48,469	3,951	-
2a.1.5.5	Auxiliary Feedwater - RCA	10	42	2	4	8	22	-	23	111	111	-	-	112	95	-	-	-	10,834	1,028	-
2a.1.5.6	Auxiliary Steam	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	34
2a.1.5.7	Auxiliary Steam - Insulated	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	-	1,031
2a.1.5.8	Auxiliary Steam - Insulated - RCA	-	10	1	1	3	6	-	5	25	25	-	-	46	24	-	-	-	3,455	202	-
2a.1.5.9	Auxiliary Steam - RCA	-	0	0	0	0	0	-	0	1	1	-	-	1	1	-	-	-	65	6	-
2a.1.5.10	Breathing Air - Insulated - RCA	-	5	0	0	1	2	-	2	11	11	-	-	10	10	-	-	-	1,056	111	-
2a.1.5.11	Breathing Air - RCA	-	79	5	9	33	45	-	38	209	209	-	-	472	191	-	-	-	31,813	1,604	-
2a.1.5.12	Chemical & Volume Control	504	491	72	119	278	715	-	620	2,799	2,799	-	-	3,956	3,143	-	-	-	361,591	19,654	-
2a.1.5.13	Chemical & Volume Control - Insulated	267	497	31	44	23	317	-	350	1,529	1,529	-	-	321	1,348	-	-	-	102,209	14,411	-
2a.1.5.14	Circulating Water	-	116	-	-	-	-	-	17	134	-	-	134	-	-	-	-	-	-	-	2,697
2a.1.5.15	Component Cooling Water	-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	-	4,791
2a.1.5.16	Component Cooling Water - RCA	-	531	49	92	401	428	-	319	1,819	1,819	-	-	5,702	1,817	-	-	-	351,754	10,592	-
2a.1.5.17	Condensate	-	206	-	-	-	-	-	31	237	-	-	237	-	-	-	-	-	-	-	4,701
2a.1.5.18	Condensate - Insulated	-	80	-	-	-	-	-	12	92	-	-	92	-	-	-	-	-	-	-	1,892
2a.1.5.19	Condensate Polishing	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	-	784
2a.1.5.20	Condensate Polishing - Ins	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	-	2,448
2a.1.5.21	Condensate Recovery	-	25	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	-	554
2a.1.5.22	Condensate Recovery - Insulated	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	-	99
2a.1.5.23	Condensate Recovery - Insulated - RCA	-	9	0	1	1	4	-	4	20	20	-	-	17	19	-	-	-	1,911	187	-
2a.1.5.24	Condensate Recovery - RCA	-	33	2	3	5	17	-	14	73	73	-	-	64	73	-	-	-	7,443	641	-

Table C-2  
Turkey Point Nuclear Plant, Unit 4  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed	Burial Volumes				Burial /	Craft Manhours	Utility and Contractor Manhours	
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.			
Disposal of Plant Systems (continued)																						
2a.1.5.25	Condensate Storage	-	75	-	-	-	-	-	11	86	-	-	86	-	-	-	-	-	-	-	1,651	-
2a.1.5.26	Condenser	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	-	636	-
2a.1.5.27	Containment Post Accident Eval	-	15	0	1	4	3	-	5	29	29	-	-	59	13	-	-	-	-	3,305	320	-
2a.1.5.28	Containment Post Accident Eval - Ins	-	25	2	2	3	13	-	10	55	55	-	-	42	57	-	-	-	-	5,479	473	-
2a.1.5.29	Containment Purge	-	49	5	10	51	41	-	32	189	189	-	-	729	175	-	-	-	-	41,193	970	-
2a.1.5.30	Electrical - Clean	-	2,143	-	-	-	-	-	321	2,464	-	-	2,464	-	-	-	-	-	-	-	47,559	-
2a.1.5.31	Extraction Steam	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	-	317	-
2a.1.5.32	Extraction Steam - Insulated	-	80	-	-	-	-	-	12	92	-	-	92	-	-	-	-	-	-	-	1,908	-
2a.1.5.33	Feedwater	-	143	-	-	-	-	-	21	165	-	-	165	-	-	-	-	-	-	-	3,134	-
2a.1.5.34	Feedwater - Insulated	-	240	-	-	-	-	-	36	276	-	-	276	-	-	-	-	-	-	-	5,619	-
2a.1.5.35	Feedwater - Insulated - RCA	-	116	9	16	68	78	-	62	350	350	-	-	973	333	-	-	-	-	61,553	2,345	-
2a.1.5.36	Feedwater - RCA	-	11	1	2	7	8	-	6	34	34	-	-	96	33	-	-	-	-	6,109	221	-
2a.1.5.37	Feedwater Heater Drains & Vents	-	52	-	-	-	-	-	8	60	-	-	60	-	-	-	-	-	-	-	1,202	-
2a.1.5.38	Feedwater Heater Drains & Vents - Ins	-	386	-	-	-	-	-	58	444	-	-	444	-	-	-	-	-	-	-	9,047	-
2a.1.5.39	Fire Protection	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	-	7,798	-
2a.1.5.40	Generator	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	-	126	-
2a.1.5.41	Generator - Insulated	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	47	-
2a.1.5.42	HVAC - Clean	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	-	4,217	-
2a.1.5.43	Instrument Air	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	-	501	-
2a.1.5.44	Instrument Air - Insulated	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	-	445	-
2a.1.5.45	Intake Cooling Water	-	211	-	-	-	-	-	32	243	-	-	243	-	-	-	-	-	-	-	4,964	-
2a.1.5.46	Main Steam - Insulated	-	204	-	-	-	-	-	31	235	-	-	235	-	-	-	-	-	-	-	4,732	-
2a.1.5.47	Main Steam - Insulated - RCA	-	63	5	10	46	46	-	36	207	207	-	-	660	197	-	-	-	-	39,819	1,276	-
2a.1.5.48	Nitrogen & Hydrogen	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	27	-
2a.1.5.49	Nitrogen & Hydrogen - RCA	-	2	0	0	0	1	-	1	4	4	-	-	2	5	-	-	-	-	455	28	-
2a.1.5.50	Reactor Coolant - Insulated	42	86	5	8	5	54	-	59	258	258	-	-	68	229	-	-	-	-	17,906	2,416	-
2a.1.5.51	Safety Injection	-	219	9	28	256	36	-	107	654	654	-	-	3,639	157	-	-	-	-	157,784	4,572	-
2a.1.5.52	Safety Injection - Insulated	-	162	12	20	69	106	-	82	451	451	-	-	983	451	-	-	-	-	69,743	3,235	-
2a.1.5.53	Sample - NSSS	-	51	2	2	6	12	-	17	90	90	-	-	83	51	-	-	-	-	6,769	1,143	-
2a.1.5.54	Sample - NSSS - Ins	-	64	2	2	0	15	-	20	104	104	-	-	4	65	-	-	-	-	4,468	1,446	-
2a.1.5.55	Screen Wash	-	34	-	-	-	-	-	5	39	-	-	39	-	-	-	-	-	-	-	757	-
2a.1.5.56	Secondary Sample	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	-	87	-
2a.1.5.57	Secondary Sample - RCA	-	4	0	0	1	1	-	1	8	8	-	-	14	3	-	-	-	-	792	95	-
2a.1.5.58	Secondary Wet Layup	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	-	543	-
2a.1.5.59	Secondary Wet Layup - RCA	-	22	1	2	5	14	-	10	54	54	-	-	75	58	-	-	-	-	6,843	421	-
2a.1.5.60	Turbine Building HVAC	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	-	451	-
2a.1.5.61	Turbine Lube Oil	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	-	1,197	-
2a.1.5.62	Turbine Plant Chemical Addition	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	-	112	-
2a.1.5.63	Turbine Plant Cooling Water	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	-	2,416	-
2a.1.5.64	Turbine Plant Cooling Water - Insulated	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	-	1,440	-
2a.1.5.65	Turbine Steam	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	-	2,165	-
2a.1.5.66	Turbine Steam - Insulated	-	43	-	-	-	-	-	6	49	-	-	49	-	-	-	-	-	-	-	1,009	-
2a.1.5	Totals	823	8,312	225	392	1,310	2,085	-	2,736	15,883	9,528	-	6,355	18,642	8,965	-	-	-	-	1,342,817	197,308	-
2a.1.6	Scaffolding in support of decommissioning	-	430	9	4	32	8	-	116	599	599	-	-	407	36	-	-	-	-	20,679	10,412	-
2a.1	Subtotal Period 2a Activity Costs	1,526	23,009	16,957	12,963	3,474	27,857	618	26,715	113,120	106,764	-	6,355	54,620	60,202	587	842	-	-	7,982,586	329,375	6,360
Period 2a Additional Costs																						
2a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,758	527	2,285	2,285	-	-	-	-	-	-	-	-	-	33,315	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	-	-	-	1,758	527	2,285	2,285	-	-	-	-	-	-	-	-	-	33,315	-
Period 2a Collateral Costs																						
2a.3.1	Process decommissioning water waste	161	-	107	475	-	429	-	270	1,442	1,442	-	-	-	1,035	-	-	-	-	62,086	202	-
2a.3.2	Process decommissioning chemical flush waste	1	-	23	134	-	173	-	66	396	396	-	-	-	234	-	-	-	-	24,986	44	-
2a.3.3	Small tool allowance	-	293	-	-	-	-	-	44	337	303	-	34	-	-	-	-	-	-	-	-	-
2a.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	131	13	144	144	-	-	-	-	-	-	-	-	-	-	-
2a.3.5	Fixed Overhead	-	-	-	-	-	-	2,853	428	3,281	3,281	-	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	161	293	131	609	-	602	2,984	821	5,600	5,566	-	34	-	1,269	-	-	-	-	87,071	246	-
Period 2a Period-Dependent Costs																						
2a.4.1	Decon supplies	90	-	-	-	-	-	-	22	112	112	-	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	1,104	110	1,214	1,214	-	-	-	-	-	-	-	-	-	-	-

**Table C-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes					Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet					
Period 2a Period-Dependent Costs (continued)																							
2a.4.3	Property taxes	-	-	-	-	-	-	23	2	25	23	-	3	-	-	-	-	-	-	-	-	-	
2a.4.4	Health physics supplies	-	2,342	-	-	-	-	-	586	2,928	2,928	-	-	-	-	-	-	-	-	-	-	-	
2a.4.5	Heavy equipment rental	-	4,079	-	-	-	-	-	612	4,690	4,690	-	-	-	-	-	-	-	-	-	-	-	
2a.4.6	Disposal of DAW generated	-	-	89	29	-	302	-	89	509	509	-	-	-	4,236	-	-	-	-	-	84,717	138	
2a.4.7	Plant energy budget	-	-	-	-	-	-	4,447	667	5,114	5,114	-	-	-	-	-	-	-	-	-	-	-	
2a.4.8	NRC Fees	-	-	-	-	-	-	706	71	776	776	-	-	-	-	-	-	-	-	-	-	-	
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	735	73	808	-	808	-	-	-	-	-	-	-	-	-	-	
2a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,278	192	1,470	-	1,470	-	-	-	-	-	-	-	-	-	-	
2a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	78	12	90	-	90	-	-	-	-	-	-	-	-	-	-	
2a.4.12	NEI Fees	-	-	-	-	-	-	581	58	639	639	-	-	-	-	-	-	-	-	-	-	-	
2a.4.13	Security Staff Cost	-	-	-	-	-	-	15,578	2,337	17,915	17,915	-	-	-	-	-	-	-	-	-	-	300,857	
2a.4.14	DOC Staff Cost	-	-	-	-	-	-	21,798	3,270	25,068	25,068	-	-	-	-	-	-	-	-	-	-	254,057	
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	36,349	5,452	41,801	41,801	-	-	-	-	-	-	-	-	-	-	469,471	
2a.4	Subtotal Period 2a Period-Dependent Costs	90	6,421	89	29	-	302	82,677	13,553	103,160	100,789	2,368	3	-	4,236	-	-	-	-	-	84,717	138	1,024,385
2a.0	TOTAL PERIOD 2a COST	1,777	29,723	17,176	13,601	3,474	28,760	88,037	41,616	224,165	215,405	2,368	6,392	54,620	65,707	587	842	-	-	-	8,154,374	363,074	1,030,745
<b>PERIOD 2b - Site Decontamination</b>																							
Period 2b Direct Decommissioning Activities																							
Disposal of Plant Systems																							
2b.1.1.1	Auxiliary Bldg HVAC	-	257	8	25	230	36	-	112	669	669	-	-	3,269	154	-	-	-	-	-	142,969	4,804	-
2b.1.1.2	Containment Emergency Filter	-	5	0	0	3	0	-	2	11	11	-	-	45	2	-	-	-	-	-	1,945	111	-
2b.1.1.3	Containment Normal & Emerg Cooling	-	597	19	55	493	81	-	254	1,500	1,500	-	-	7,013	346	-	-	-	-	-	307,692	10,880	-
2b.1.1.4	Containment Normal & Emerg Cooling - Ins	-	6	1	1	1	5	-	3	16	16	-	-	9	21	-	-	-	-	-	1,745	107	-
2b.1.1.5	Containment Spray	-	80	6	10	37	50	-	40	224	224	-	-	531	213	-	-	-	-	-	35,710	1,561	-
2b.1.1.6	Containment Spray - Insulated	-	64	5	7	15	43	-	30	164	164	-	-	217	180	-	-	-	-	-	20,782	1,224	-
2b.1.1.7	Control Building HVAC	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	-	-	636	-
2b.1.1.8	EDG Building HVAC	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	-	-	79	-
2b.1.1.9	Electrical - Decontaminated	-	3,124	154	285	823	1,606	-	1,364	7,357	7,357	-	-	11,710	6,826	-	-	-	-	-	926,754	60,340	-
2b.1.1.10	Emergency Diesel Engine & Oil	-	75	-	-	-	-	-	11	86	-	-	86	-	-	-	-	-	-	-	-	1,676	-
2b.1.1.11	Emergency Diesel Engine & Oil - Ins	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	-	-	77	-
2b.1.1.12	Fire Protection - RCA	-	1,069	80	143	559	704	-	556	3,110	3,110	-	-	7,953	2,987	-	-	-	-	-	520,594	21,118	-
2b.1.1.13	HVAC - Contaminated	-	54	1	5	44	6	-	22	132	132	-	-	627	24	-	-	-	-	-	27,004	967	-
2b.1.1.14	Instrument Air - Insulated - RCA	-	121	6	8	10	50	-	46	240	240	-	-	145	213	-	-	-	-	-	20,004	2,478	-
2b.1.1.15	Instrument Air - RCA	-	74	4	5	7	33	-	29	152	152	-	-	95	140	-	-	-	-	-	13,138	1,515	-
2b.1.1.16	Miscellaneous - RCA	-	7	1	2	11	9	-	6	35	35	-	-	155	37	-	-	-	-	-	8,715	144	-
2b.1.1.17	Primary Water Makeup	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	-	-	1,668	-
2b.1.1.18	Radwaste Building HVAC	-	120	3	10	95	12	-	49	289	289	-	-	1,357	51	-	-	-	-	-	58,480	2,190	-
2b.1.1.19	Refueling Equipment	-	172	16	28	63	167	-	100	546	546	-	-	901	709	-	-	-	-	-	83,486	3,615	-
2b.1.1.20	Residual Heat Removal	194	88	82	110	106	768	-	351	1,700	1,700	-	-	1,507	3,260	-	-	-	-	-	277,044	2,113	-
2b.1.1.21	Residual Heat Removal - Insulated	338	324	51	75	71	520	-	407	1,784	1,784	-	-	1,004	2,207	-	-	-	-	-	186,810	8,536	-
2b.1.1.22	Safety Injection Accumulator	-	264	19	38	216	142	-	142	821	821	-	-	3,074	604	-	-	-	-	-	164,699	5,317	-
2b.1.1.23	Service Water	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	-	-	487	-
2b.1.1.24	Service Water - Insulated	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	-	-	204	-
2b.1.1.25	Service Water - Insulated - RCA	-	76	6	7	10	47	-	34	180	180	-	-	147	199	-	-	-	-	-	19,189	1,434	-
2b.1.1.26	Service Water - RCA	-	168	13	16	23	109	-	77	406	406	-	-	329	462	-	-	-	-	-	43,977	3,129	-
2b.1.1.27	Steam Generator Wet Layup	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	-	25	-
2b.1.1.28	Steam Generator Wet Layup - RCA	-	2	0	0	0	1	-	1	4	4	-	-	2	5	-	-	-	-	-	455	28	-
2b.1.1.29	Waste Disposal	354	411	52	81	157	506	-	447	2,006	2,006	-	-	2,236	2,200	-	-	-	-	-	232,818	14,803	-
2b.1.1.30	Waste Disposal - Insulated	378	503	45	56	20	411	-	433	1,845	1,845	-	-	283	1,742	-	-	-	-	-	126,869	16,384	-
2b.1.1.31	Water Treatment Plant	-	137	-	-	-	-	-	21	158	-	-	158	-	-	-	-	-	-	-	-	3,065	-
2b.1.1.32	Water Treatment Plant - Insulated	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	-	-	2,338	-
2b.1.1	Totals	1,263	8,040	571	966	2,994	5,306	-	4,574	23,714	23,192	-	522	42,611	22,583	-	-	-	-	-	3,220,881	173,051	-
2b.1.2	Scaffolding in support of decommissioning	-	537	12	5	40	11	-	145	748	748	-	-	509	45	-	-	-	-	-	25,849	13,015	-
Decontamination of Site Buildings																							
2b.1.3.1	Containment	859	1,096	49	638	168	1,225	-	1,135	5,168	5,168	-	-	2,384	15,152	-	-	-	-	-	1,301,378	36,545	-
2b.1.3.2	Auxiliary	409	190	8	92	82	122	-	309	1,209	1,209	-	-	1,163	1,889	-	-	-	-	-	209,701	11,687	-
2b.1.3.3	LLW Storage Area Soil Disposal	-	108	214	3,699	-	4,933	-	1,837	10,791	10,791	-	-	-	81,327	-	-	-	-	-	7,047,000	1,548	-
2b.1.3.4	LLW Storage Bldg B&C Waste	14	5	0	2	-	3	-	10	34	34	-	-	-	50	-	-	-	-	-	4,320	386	-

Table C-2  
Turkey Point Nuclear Plant, Unit 4  
DECON Decommissioning Cost Estimate  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site	LLRW	Other Costs	Total Contingency	Total Costs	NRC	Spent Fuel	Site	Processed	Burial Volumes				Burial /	Craft Manhours	Utility and Contractor Manhours
						Processing Costs	Disposal Costs				Lic. Term. Costs	Management Costs	Restoration Costs	Volume Cu. Feet	Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Processed Wt., Lbs.		
Decontamination of Site Buildings (continued)																					
2b.1.3.5	Radwaste Solidification	127	68	2	30	13	40	-	97	378	378	-	-	181	639	-	-	-	62,586	3,824	-
2b.1.3	Totals	1,409	1,467	273	4,461	262	6,322	-	3,387	17,580	17,580	-	-	3,728	99,057	-	-	-	8,624,984	53,989	-
2b.1	Subtotal Period 2b Activity Costs	2,672	10,044	856	5,432	3,295	11,639	-	8,106	42,042	41,521	-	522	46,847	121,685	-	-	-	11,871,710	240,055	-
Period 2b Additional Costs																					
2b.2.1	Remedial Action Surveys	-	-	-	-	-	-	2,452	736	3,188	3,188	-	-	-	-	-	-	-	-	46,470	-
2b.2.2	Seaweed Remediation & Disposal	-	45	1	374	-	415	-	171	1,008	1,008	-	-	-	29,650	-	-	-	593,000	494	-
2b.2.3	Underground Services Excavation	-	351	-	-	-	-	468	123	942	-	-	942	-	-	-	-	-	-	8,000	-
2b.2	Subtotal Period 2b Additional Costs	-	396	1	374	-	415	2,920	1,030	5,137	4,195	-	942	-	29,650	-	-	-	593,000	54,964	-
Period 2b Collateral Costs																					
2b.3.1	Process decommissioning water waste	97	-	66	294	-	266	-	166	889	889	-	-	-	641	-	-	-	38,431	125	-
2b.3.2	Process decommissioning chemical flush waste	4	-	148	850	-	1,097	-	418	2,517	2,517	-	-	-	1,490	-	-	-	158,738	279	-
2b.3.3	Small tool allowance	-	187	-	-	-	-	-	28	215	215	-	-	-	-	-	-	-	-	-	-
2b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	58,927	8,839	67,766	-	67,766	-	-	-	-	-	-	-	-	-
2b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	308	31	338	338	-	-	-	-	-	-	-	-	-	-
2b.3.6	Fixed Overhead	-	-	-	-	-	-	3,980	597	4,577	4,577	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	101	187	215	1,144	-	1,362	63,214	10,079	76,302	8,536	67,766	-	-	2,130	-	-	-	197,169	404	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	710	-	-	-	-	-	-	178	888	888	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	1,316	132	1,448	1,448	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	32	3	36	36	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	2,270	-	-	-	-	-	567	2,837	2,837	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	5,842	-	-	-	-	-	876	6,718	6,718	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	90	30	-	306	-	90	516	516	-	-	-	4,298	-	-	-	85,958	140	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	4,897	735	5,631	5,631	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	984	98	1,083	1,083	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	1,025	102	1,127	-	1,127	-	-	-	-	-	-	-	-	-
2b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	1,783	267	2,050	-	2,050	-	-	-	-	-	-	-	-	-
2b.4.11	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	451	68	519	519	-	-	-	-	-	-	-	-	-	-
2b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	109	16	126	-	126	-	-	-	-	-	-	-	-	-
2b.4.13	NEI Fees	-	-	-	-	-	-	810	81	891	891	-	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	21,730	3,259	24,989	24,989	-	-	-	-	-	-	-	-	-	419,657
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	29,369	4,405	33,775	33,775	-	-	-	-	-	-	-	-	-	340,389
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	49,252	7,388	56,640	56,640	-	-	-	-	-	-	-	-	-	631,817
2b.4	Subtotal Period 2b Period-Dependent Costs	710	8,111	90	30	-	306	111,759	18,267	139,273	135,970	3,303	-	-	4,298	-	-	-	85,958	140	1,391,863
2b.0	TOTAL PERIOD 2b COST	3,483	18,739	1,162	6,980	3,295	13,722	177,893	37,481	262,755	190,223	71,069	1,464	46,847	157,763	-	-	-	12,747,840	295,563	1,391,863
<b>PERIOD 2d - Decontamination Following Wet Fuel Storage</b>																					
Period 2d Direct Decommissioning Activities																					
2d.1.1	Remove spent fuel racks	423	42	161	115	-	874	-	474	2,088	2,088	-	-	-	3,714	-	-	-	245,474	1,023	-
Disposal of Plant Systems																					
2d.1.2.1	Electrical - Contaminated	-	349	5	17	159	20	-	119	670	670	-	-	2,267	85	-	-	-	97,707	6,731	-
2d.1.2.2	Fuel Handling HVAC	-	56	2	5	47	6	-	23	138	138	-	-	662	25	-	-	-	28,530	1,047	-
2d.1.2.3	Spent Fuel Pool Cooling	84	117	16	22	17	159	-	119	535	535	-	-	249	678	-	-	-	54,881	3,370	-
2d.1.2.4	Spent Fuel Pool Cooling - Insulated	47	59	7	9	6	67	-	58	253	253	-	-	83	282	-	-	-	22,060	1,717	-
2d.1.2	Totals	131	582	29	54	229	252	-	319	1,596	1,596	-	-	3,260	1,071	-	-	-	203,178	12,864	-
Decontamination of Site Buildings																					
2d.1.3.1	Fuel Handling	334	396	4	20	92	27	-	290	1,162	1,162	-	-	1,306	298	-	-	-	77,447	14,581	-
2d.1.3	Totals	334	396	4	20	92	27	-	290	1,162	1,162	-	-	1,306	298	-	-	-	77,447	14,581	-
2d.1.4	Scaffolding in support of decommissioning	-	107	2	1	8	2	-	29	150	150	-	-	102	9	-	-	-	5,170	2,603	-
2d.1	Subtotal Period 2d Activity Costs	888	1,127	197	189	329	1,155	-	1,112	4,996	4,996	-	-	4,668	5,091	-	-	-	531,270	31,071	-

**Table C-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2d Additional Costs																						
2d.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,098	330	1,428	1,428	-	-	-	-	-	-	-	-	-	-	6,240
2d.2.2	Remedial Action Surveys	-	-	-	-	-	-	679	204	883	883	-	-	-	-	-	-	-	-	-	12,870	-
2d.2.3	Operational Equipment	-	-	18	62	506	-	-	87	674	674	-	-	11,710	-	-	-	-	-	292,750	32	-
2d.2	Subtotal Period 2d Additional Costs	-	-	18	62	506	-	1,778	620	2,985	2,985	-	-	11,710	-	-	-	-	-	292,750	12,902	6,240
Period 2d Collateral Costs																						
2d.3.1	Process decommissioning water waste	58	-	40	177	-	160	-	100	534	534	-	-	-	386	-	-	-	-	23,147	75	-
2d.3.2	Process decommissioning chemical flush waste	0	-	16	93	-	120	-	46	275	275	-	-	-	163	-	-	-	-	17,341	30	-
2d.3.3	Small tool allowance	-	32	-	-	-	-	-	5	36	36	-	-	-	-	-	-	-	-	-	-	-
2d.3.4	Decommissioning Equipment Disposition	-	-	138	68	467	124	-	125	923	923	-	-	6,000	529	-	-	-	-	304,968	88	-
2d.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	18,823	2,823	21,647	-	21,647	-	-	-	-	-	-	-	-	-	-
2d.3.6	Florida LLRW Inspection Fee	-	-	-	-	-	-	14	1	15	15	-	-	-	-	-	-	-	-	-	-	-
2d.3.7	Fixed Overhead	-	-	-	-	-	-	1,102	165	1,268	1,268	-	-	-	-	-	-	-	-	-	-	-
2d.3	Subtotal Period 2d Collateral Costs	58	32	194	338	467	404	19,939	3,265	24,698	3,051	21,647	-	6,000	1,078	-	-	-	-	345,456	194	-
Period 2d Period-Dependent Costs																						
2d.4.1	Decon supplies	83	-	-	-	-	-	-	21	104	104	-	-	-	-	-	-	-	-	-	-	-
2d.4.2	Insurance	-	-	-	-	-	-	365	36	401	401	-	-	-	-	-	-	-	-	-	-	-
2d.4.3	Property taxes	-	-	-	-	-	-	9	1	10	10	-	-	-	-	-	-	-	-	-	-	-
2d.4.4	Health physics supplies	-	422	-	-	-	-	-	105	527	527	-	-	-	-	-	-	-	-	-	-	-
2d.4.5	Heavy equipment rental	-	1,618	-	-	-	-	-	243	1,861	1,861	-	-	-	-	-	-	-	-	-	-	-
2d.4.6	Disposal of DAW generated	-	-	20	7	-	68	-	20	114	114	-	-	951	-	-	-	-	-	19,023	31	-
2d.4.7	Plant energy budget	-	-	-	-	-	-	723	108	832	832	-	-	-	-	-	-	-	-	-	-	-
2d.4.8	NRC Fees	-	-	-	-	-	-	231	23	254	254	-	-	-	-	-	-	-	-	-	-	-
2d.4.9	Emergency Planning Fees	-	-	-	-	-	-	284	28	312	-	312	-	-	-	-	-	-	-	-	-	-
2d.4.10	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-	-	-	-	-	-
2d.4.11	ISFSI Operating Costs	-	-	-	-	-	-	30	5	35	-	35	-	-	-	-	-	-	-	-	-	-
2d.4.12	NEI Fees	-	-	-	-	-	-	224	22	247	247	-	-	-	-	-	-	-	-	-	-	-
2d.4.13	Security Staff Cost	-	-	-	-	-	-	1,326	199	1,524	1,524	-	-	-	-	-	-	-	-	-	-	27,120
2d.4.14	DOC Staff Cost	-	-	-	-	-	-	5,496	824	6,321	6,321	-	-	-	-	-	-	-	-	-	-	64,571
2d.4.15	Utility Staff Cost	-	-	-	-	-	-	10,054	1,508	11,562	11,562	-	-	-	-	-	-	-	-	-	-	123,331
2d.4	Subtotal Period 2d Period-Dependent Costs	83	2,040	20	7	-	68	18,991	3,182	24,390	24,043	347	-	-	951	-	-	-	-	19,023	31	215,023
2d.0	TOTAL PERIOD 2d COST	1,029	3,198	430	596	1,302	1,627	40,708	8,179	57,069	35,076	21,994	-	22,378	7,120	-	-	-	-	1,188,499	44,198	221,263
<b>PERIOD 2f - License Termination</b>																						
Period 2f Direct Decommissioning Activities																						
2f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	162	49	210	210	-	-	-	-	-	-	-	-	-	-	-
2f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
2f.1	Subtotal Period 2f Activity Costs	-	-	-	-	-	-	162	49	210	210	-	-	-	-	-	-	-	-	-	-	-
Period 2f Additional Costs																						
2f.2.1	License Termination Survey	-	-	-	-	-	-	3,494	1,048	4,543	4,543	-	-	-	-	-	-	-	-	-	59,744	3,120
2f.2	Subtotal Period 2f Additional Costs	-	-	-	-	-	-	3,494	1,048	4,543	4,543	-	-	-	-	-	-	-	-	-	59,744	3,120
Period 2f Collateral Costs																						
2f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,549	232	1,781	1,781	-	-	-	-	-	-	-	-	-	-	-
2f.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,897	285	2,182	-	2,182	-	-	-	-	-	-	-	-	-	-
2f.3.3	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	-	-
2f.3.4	Fixed Overhead	-	-	-	-	-	-	1,346	202	1,548	1,548	-	-	-	-	-	-	-	-	-	-	-
2f.3	Subtotal Period 2f Collateral Costs	-	-	-	-	-	-	4,792	719	5,511	3,329	2,182	-	-	-	-	-	-	-	-	-	-
Period 2f Period-Dependent Costs																						
2f.4.1	Insurance	-	-	-	-	-	-	445	45	490	490	-	-	-	-	-	-	-	-	-	-	-
2f.4.2	Property taxes	-	-	-	-	-	-	11	1	12	12	-	-	-	-	-	-	-	-	-	-	-
2f.4.3	Health physics supplies	-	386	-	-	-	-	-	97	483	483	-	-	-	-	-	-	-	-	-	-	-
2f.4.4	Disposal of DAW generated	-	-	5	2	-	18	-	5	30	30	-	-	250	-	-	-	-	-	4,992	8	-
2f.4.5	Plant energy budget	-	-	-	-	-	-	442	66	508	508	-	-	-	-	-	-	-	-	-	-	-
2f.4.6	NRC Fees	-	-	-	-	-	-	308	31	339	339	-	-	-	-	-	-	-	-	-	-	-
2f.4.7	Emergency Planning Fees	-	-	-	-	-	-	347	35	381	-	381	-	-	-	-	-	-	-	-	-	-
2f.4.8	ISFSI Operating Costs	-	-	-	-	-	-	37	6	43	-	43	-	-	-	-	-	-	-	-	-	-
2f.4.9	NEI Fees	-	-	-	-	-	-	274	27	301	301	-	-	-	-	-	-	-	-	-	-	-

**Table C-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 2f Period-Dependent Costs (continued)																					
2f.4.10	Security Staff Cost	-	-	-	-	-	-	1,619	243	1,862	1,862	-	-	-	-	-	-	-	-	-	33,120
2f.4.11	DOC Staff Cost	-	-	-	-	-	-	3,896	584	4,480	4,480	-	-	-	-	-	-	-	-	-	46,920
2f.4.12	Utility Staff Cost	-	-	-	-	-	-	5,094	764	5,859	5,859	-	-	-	-	-	-	-	-	-	60,326
2f.4	Subtotal Period 2f Period-Dependent Costs	-	386	5	2	-	18	12,473	1,903	14,787	14,363	424	-	-	250	-	-	-	4,992	8	140,366
2f.0	TOTAL PERIOD 2f COST	-	386	5	2	-	18	20,921	3,719	25,052	22,446	2,606	-	-	250	-	-	-	4,992	59,752	143,486
<b>PERIOD 2 TOTALS</b>		<b>6,289</b>	<b>52,046</b>	<b>18,774</b>	<b>21,178</b>	<b>8,071</b>	<b>44,127</b>	<b>327,560</b>	<b>90,995</b>	<b>569,041</b>	<b>463,149</b>	<b>98,036</b>	<b>7,855</b>	<b>123,845</b>	<b>230,840</b>	<b>587</b>	<b>842</b>	<b>-</b>	<b>22,095,710</b>	<b>762,587</b>	<b>2,787,356</b>
<b>PERIOD 3b - Site Restoration</b>																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Containment	-	4,215	-	-	-	-	-	632	4,847	-	-	4,847	-	-	-	-	-	-	-	47,002
3b.1.1.2	Auxiliary	-	1,094	-	-	-	-	-	164	1,258	-	-	1,258	-	-	-	-	-	-	-	14,669
3b.1.1.3	Control	-	125	-	-	-	-	-	19	143	-	-	143	-	-	-	-	-	-	-	1,695
3b.1.1.4	Intake	-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	-	1,577
3b.1.1.5	LLW Storage Bldg B&C Waste	-	367	-	-	-	-	-	55	422	-	-	422	-	-	-	-	-	-	-	3,926
3b.1.1.6	Maintenance Professional Facility	-	857	-	-	-	-	-	128	985	-	-	985	-	-	-	-	-	-	-	9,370
3b.1.1.7	Miscellaneous Structures - Clean	-	2,814	-	-	-	-	-	422	3,236	-	-	3,236	-	-	-	-	-	-	-	40,579
3b.1.1.8	Radwaste Solidification	-	800	-	-	-	-	-	120	920	-	-	920	-	-	-	-	-	-	-	9,915
3b.1.1.9	Sealwell	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	-	1,251
3b.1.1.10	Security Improvements	-	305	-	-	-	-	-	46	351	-	-	351	-	-	-	-	-	-	-	2,380
3b.1.1.11	Turbine	-	417	-	-	-	-	-	63	480	-	-	480	-	-	-	-	-	-	-	6,507
3b.1.1.12	Turbine Pedestal	-	488	-	-	-	-	-	73	561	-	-	561	-	-	-	-	-	-	-	5,055
3b.1.1.13	Fuel Handling	-	527	-	-	-	-	-	79	606	-	-	606	-	-	-	-	-	-	-	6,475
3b.1.1	Totals	-	12,244	-	-	-	-	-	1,837	14,081	-	-	14,081	-	-	-	-	-	-	-	150,403
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	1,525	-	-	-	-	-	229	1,753	-	-	1,753	-	-	-	-	-	-	-	8,328
3b.1.3	Grade & landscape site	-	446	-	-	-	-	-	67	513	-	-	513	-	-	-	-	-	-	-	1,043
3b.1.4	Final report to NRC	-	-	-	-	-	-	85	13	98	98	-	-	-	-	-	-	-	-	-	668
3b.1	Subtotal Period 3b Activity Costs	-	14,215	-	-	-	-	85	2,145	16,445	98	-	16,347	-	-	-	-	-	-	-	159,774
Period 3b Additional Costs																					
3b.2.1	Concrete Crushing	-	512	-	-	-	-	7	78	597	-	-	597	-	-	-	-	-	-	-	2,535
3b.2.2	Intake Structure Cofferdam	-	213	-	-	-	-	-	32	244	-	-	244	-	-	-	-	-	-	-	1,896
3b.2.3	Discharge Structure Cofferdam	-	232	-	-	-	-	-	35	266	-	-	266	-	-	-	-	-	-	-	2,066
3b.2.4	Construction Debris	-	-	-	-	-	-	330	50	380	-	-	380	-	-	-	-	-	-	-	-
3b.2	Subtotal Period 3b Additional Costs	-	956	-	-	-	-	337	194	1,487	-	-	1,487	-	-	-	-	-	-	-	6,497
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	134	-	-	-	-	-	20	154	-	-	154	-	-	-	-	-	-	-	-
3b.3.2	Spent Fuel Capital and Transfer	-	-	-	-	-	-	69	10	80	-	80	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	134	-	-	-	-	69	31	234	-	80	154	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	640	64	704	-	352	352	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	28	3	30	-	30	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	6,855	-	-	-	-	-	1,028	7,883	-	-	7,883	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	557	84	640	-	-	640	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	353	35	389	-	389	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	874	87	962	-	962	-	-	-	-	-	-	-	-	-
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	93	14	107	-	107	-	-	-	-	-	-	-	-	-
3b.4.8	Security Staff Cost	-	-	-	-	-	-	4,082	612	4,694	-	3,521	1,174	-	-	-	-	-	-	-	83,520
3b.4.9	DOC Staff Cost	-	-	-	-	-	-	9,488	1,423	10,911	-	-	10,911	-	-	-	-	-	-	-	105,394
3b.4.10	Utility Staff Cost	-	-	-	-	-	-	5,645	847	6,492	(0)	1,233	5,259	-	-	-	-	-	-	-	67,134
3b.4	Subtotal Period 3b Period-Dependent Costs	-	6,855	-	-	-	-	21,761	4,198	32,813	(0)	6,595	26,219	-	-	-	-	-	-	-	256,048
3b.0	TOTAL PERIOD 3b COST	-	22,160	-	-	-	-	22,253	6,567	50,980	98	6,674	44,208	-	-	-	-	-	-	166,271	256,716

**Table C-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 3c - Fuel Storage Operations/Shipping</b>																						
Period 3c Collateral Costs																						
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	28,467	4,270	32,737	-	32,737	-	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	28,467	4,270	32,737	-	32,737	-	-	-	-	-	-	-	-	-	
Period 3c Period-Dependent Costs																						
3c.4.1	Insurance	-	-	-	-	-	-	10,408	1,041	11,448	-	11,448	-	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	447	45	491	-	491	-	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	5,734	573	6,308	-	6,308	-	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	14,181	1,418	15,599	-	15,599	-	-	-	-	-	-	-	-	-	-
3c.4.6	ISFSI Operating Costs	-	-	-	-	-	-	1,514	227	1,741	-	1,741	-	-	-	-	-	-	-	-	-	-
3c.4.7	Security Staff Cost	-	-	-	-	-	-	49,779	7,467	57,246	-	57,246	-	-	-	-	-	-	-	-	-	1,000,060
3c.4.8	Utility Staff Cost	-	-	-	-	-	-	17,851	2,678	20,529	-	20,529	-	-	-	-	-	-	-	-	-	218,078
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	99,914	13,449	113,363	-	113,363	-	-	-	-	-	-	-	-	-	1,218,138
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	128,381	17,719	146,099	-	146,099	-	-	-	-	-	-	-	-	-	1,218,138
<b>PERIOD 3d - GTCC shipping</b>																						
Period 3d Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	982	-	-	13,033	-	2,200	16,214	16,214	-	-	-	-	-	-	-	2,061	407,628	-	-
3d.1.1	Totals	-	-	982	-	-	13,033	-	2,200	16,214	16,214	-	-	-	-	-	-	-	2,061	407,628	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	982	-	-	13,033	-	2,200	16,214	16,214	-	-	-	-	-	-	-	2,061	407,628	-	-
Period 3d Collateral Costs																						
3d.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	4	0	4	-	4	-	-	-	-	-	-	-	-	-	-
3d.3	Subtotal Period 3d Collateral Costs	-	-	-	-	-	-	4	0	4	-	4	-	-	-	-	-	-	-	-	-	-
Period 3d Period-Dependent Costs																						
3d.4.1	Insurance	-	-	-	-	-	-	14	1	15	-	15	-	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	1	0	1	-	1	-	-	-	-	-	-	-	-	-	-
3d.4.4	Emergency Planning Fees	-	-	-	-	-	-	18	2	19	-	19	-	-	-	-	-	-	-	-	-	-
3d.4.5	ISFSI Operating Costs	-	-	-	-	-	-	2	0	2	-	2	-	-	-	-	-	-	-	-	-	-
3d.4.6	Security Staff Cost	-	-	-	-	-	-	62	9	71	-	71	-	-	-	-	-	-	-	-	-	1,240
3d.4.7	Utility Staff Cost	-	-	-	-	-	-	22	3	25	-	25	-	-	-	-	-	-	-	-	-	270
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	118	16	134	-	134	-	-	-	-	-	-	-	-	-	1,510
3d.0	TOTAL PERIOD 3d COST	-	-	982	-	-	13,033	122	2,217	16,353	16,214	138	-	-	-	-	-	-	2,061	407,628	-	1,510
<b>PERIOD 3e - ISFSI Decontamination</b>																						
Period 3e Direct Decommissioning Activities																						
Period 3e Additional Costs																						
3e.2.1	Decommissioning of ISFSI	-	317	2	492	-	726	1,137	669	3,343	3,343	-	-	-	10,693	-	-	-	-	1,561,386	10,512	996
3e.2	Subtotal Period 3e Additional Costs	-	317	2	492	-	726	1,137	669	3,343	3,343	-	-	-	10,693	-	-	-	-	1,561,386	10,512	996
Period 3e Collateral Costs																						
3e.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	21	5	26	26	-	-	-	-	-	-	-	-	-	-	-
3e.3	Subtotal Period 3e Collateral Costs	-	-	-	-	-	-	21	5	26	26	-	-	-	-	-	-	-	-	-	-	-
Period 3e Period-Dependent Costs																						
3e.4.1	Insurance	-	-	-	-	-	-	34	8	42	42	-	-	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	-	-
3e.4.3	Plant energy budget	-	-	-	-	-	-	97	24	121	121	-	-	-	-	-	-	-	-	-	-	-
3e.4.4	Security Staff Cost	-	-	-	-	-	-	77	19	96	96	-	-	-	-	-	-	-	-	-	-	1,729
3e.4.5	Utility Staff Cost	-	-	-	-	-	-	163	41	204	204	-	-	-	-	-	-	-	-	-	-	1,901
3e.4	Subtotal Period 3e Period-Dependent Costs	-	-	-	-	-	-	375	94	469	469	-	-	-	-	-	-	-	-	-	-	3,630
3e.0	TOTAL PERIOD 3e COST	-	317	2	492	-	726	1,533	768	3,838	3,838	-	-	-	10,693	-	-	-	-	1,561,386	10,512	4,626

**Table C-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**DECON Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 3f - ISFSI Site Restoration</b>																						
Period 3f Direct Decommissioning Activities																						
Period 3f Additional Costs																						
3f.2.1	Demolition of ISFSI	-	594	-	-	-	-	28	93	715	-	-	715	-	-	-	-	-	-	-	3,106	80
3f.2	Subtotal Period 3f Additional Costs	-	594	-	-	-	-	28	93	715	-	-	715	-	-	-	-	-	-	-	3,106	80
Period 3f Collateral Costs																						
3f.3.1	Small tool allowance	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	6	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																						
3f.4.2	Property taxes	-	-	-	-	-	-	2	0	3	-	-	3	-	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	49	7	56	-	-	56	-	-	-	-	-	-	-	-	-
3f.4.5	Security Staff Cost	-	-	-	-	-	-	15	2	18	-	-	18	-	-	-	-	-	-	-	-	349
3f.4.6	Utility Staff Cost	-	-	-	-	-	-	71	11	81	-	-	81	-	-	-	-	-	-	-	-	784
3f.4	Subtotal Period 3f Period-Dependent Costs	-	15	-	-	-	-	137	23	175	-	-	175	-	-	-	-	-	-	-	-	1,133
3f.0	TOTAL PERIOD 3f COST	-	614	-	-	-	-	166	117	897	-	-	897	-	-	-	-	-	-	-	3,106	1,213
<b>PERIOD 3 TOTALS</b>		-	23,091	984	492	-	13,758	152,454	27,387	218,166	20,149	152,912	45,104	-	10,693	-	-	2,061	1,969,014	179,888	1,482,203	
<b>TOTAL COST TO DECOMMISSION</b>		<b>9,463</b>	<b>81,754</b>	<b>20,472</b>	<b>22,551</b>	<b>13,019</b>	<b>61,967</b>	<b>585,890</b>	<b>138,400</b>	<b>933,515</b>	<b>624,798</b>	<b>255,084</b>	<b>53,633</b>	<b>147,177</b>	<b>255,340</b>	<b>1,233</b>	<b>842</b>	<b>2,061</b>	<b>25,560,520</b>	<b>999,953</b>	<b>5,245,025</b>	

<b>TOTAL COST TO DECOMMISSION WITH 17.41% CONTINGENCY:</b>	<b>\$933,515</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL NRC LICENSE TERMINATION COST IS 66.93% OR:</b>	<b>\$624,798</b>	<b>thousands of 2015 dollars</b>
<b>SPENT FUEL MANAGEMENT COST IS 27.33% OR:</b>	<b>\$255,084</b>	<b>thousands of 2015 dollars</b>
<b>NON-NUCLEAR DEMOLITION COST IS 5.75% OR:</b>	<b>\$53,633</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):</b>	<b>257,414</b>	<b>cubic feet</b>
<b>TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:</b>	<b>2,061</b>	<b>cubic feet</b>
<b>TOTAL SCRAP METAL REMOVED:</b>	<b>40,742</b>	<b>tons</b>
<b>TOTAL CRAFT LABOR REQUIREMENTS:</b>	<b>999,953</b>	<b>man-hours</b>

End Notes:  
n/a - indicates that this activity not charged as decommissioning expense.  
a - indicates that this activity performed by decommissioning staff.  
0 - indicates that this value is less than 0.5 but is non-zero.  
a cell containing " - " indicates a zero value

**APPENDIX D  
DETAILED COST ANALYSIS  
SAFSTOR**

**Tables**

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D-2	Turkey Point Nuclear Plant, Unit 4.....	13

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 1a - Shutdown through Transition</b>																						
Period 1a Direct Decommissioning Activities																						
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	407	122	529	529	-	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.4	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.5	Notification of Permanent Defueling	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.6	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	254	38	292	292	-	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	191	29	219	219	-	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	394	59	453	453	-	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	635	95	731	731	-	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																						
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	625	94	719	719	-	-	-	-	-	-	-	-	-	-	4,920
1a.1.16.2	Plant systems	-	-	-	-	-	-	529	79	609	609	-	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	396	59	456	456	-	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	254	38	292	292	-	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	254	38	292	292	-	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	2,059	309	2,368	2,368	-	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																						
1a.1.17.1	Plant systems	-	-	-	-	-	-	150	23	173	173	-	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	152	23	175	175	-	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	303	45	348	348	-	-	-	-	-	-	-	-	-	-	2,383
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	13	2	15	15	-	-	-	-	-	-	-	-	-	-	100
1a.1.19	Drain/de-energize non-cont. systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.20	Drain & dry NSSS	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.21	Drain/de-energize contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1.22	Decon/secure contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	4,967	806	5,773	5,773	-	-	-	-	-	-	-	-	-	-	35,890
Period 1a Collateral Costs																						
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	3,197	479	3,676	-	3,676	-	-	-	-	-	-	-	-	-	-
1a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	-
1a.3.3	Fixed Overhead	-	-	-	-	-	-	1,780	267	2,047	2,047	-	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	4,978	747	5,724	2,048	3,676	-	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																						
1a.4.1	Insurance	-	-	-	-	-	-	1,427	143	1,569	1,569	-	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	556	56	611	611	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	394	-	-	-	-	-	99	493	493	-	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	706	-	-	-	-	-	106	812	812	-	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	10	3	-	35	-	10	59	59	-	-	493	-	-	-	-	-	9,854	16	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,920	438	3,358	3,358	-	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	1,156	116	1,272	1,272	-	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	667	67	734	-	734	-	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	797	120	917	-	917	-	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	-	-
1a.4.11	INPO Fees	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	-	-
1a.4.12	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	7,451	1,118	8,569	8,569	-	-	-	-	-	-	-	-	-	-	147,043
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	31,842	4,776	36,618	36,618	-	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,100	10	3	-	35	48,068	7,175	56,392	54,685	1,707	-	493	-	-	-	-	9,854	16	570,443	
1a.0	TOTAL PERIOD 1a COST	-	1,100	10	3	-	35	58,012	8,727	67,889	62,506	5,383	-	493	-	-	-	-	9,854	16	606,333	

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 1b - SAFSTOR Limited DECON Activities</b>																						
Period 1b Direct Decommissioning Activities																						
Decontamination of Site Buildings																						
1b.1.1.1	Containment	849	-	-	-	-	-	-	424	1,273	1,273	-	-	-	-	-	-	-	-	-	17,275	-
1b.1.1.2	Fuel Handling	330	-	-	-	-	-	-	165	496	496	-	-	-	-	-	-	-	-	-	6,269	-
1b.1.1	Totals	1,179	-	-	-	-	-	-	590	1,769	1,769	-	-	-	-	-	-	-	-	-	23,543	-
1b.1	Subtotal Period 1b Activity Costs	1,179	-	-	-	-	-	-	590	1,769	1,769	-	-	-	-	-	-	-	-	-	23,543	-
Period 1b Collateral Costs																						
1b.3.1	Decon equipment	918	-	-	-	-	-	-	138	1,056	1,056	-	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	106	-	70	308	-	278	-	176	938	938	-	-	-	671	-	-	-	-	-	40,268	131
1b.3.4	Small tool allowance	-	19	-	-	-	-	-	3	22	22	-	-	-	-	-	-	-	-	-	-	-
1b.3.5	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,223	183	1,406	-	1,406	-	-	-	-	-	-	-	-	-	-
1b.3.6	Florida LLRW Inspection Fee	-	-	-	-	-	-	2	0	2	2	-	-	-	-	-	-	-	-	-	-	-
1b.3.7	Fixed Overhead	-	-	-	-	-	-	449	67	516	516	-	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,024	19	70	308	-	278	1,673	567	3,940	2,534	1,406	-	-	671	-	-	-	-	-	40,268	131
Period 1b Period-Dependent Costs																						
1b.4.1	Decon supplies	376	-	-	-	-	-	-	94	470	470	-	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	358	36	394	394	-	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	140	14	154	154	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	210	-	-	-	-	-	52	262	262	-	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	178	-	-	-	-	-	27	205	205	-	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	6	2	-	22	-	6	37	37	-	-	-	304	-	-	-	-	-	6,080	10
1b.4.7	Plant energy budget	-	-	-	-	-	-	736	110	847	847	-	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	173	17	190	190	-	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	168	17	185	-	185	-	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	201	30	231	-	231	-	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-	-
1b.4.12	NEI Fees	-	-	-	-	-	-	91	9	100	100	-	-	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,878	282	2,160	2,160	-	-	-	-	-	-	-	-	-	-	37,063
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	8,026	1,204	9,230	9,230	-	-	-	-	-	-	-	-	-	-	106,720
1b.4	Subtotal Period 1b Period-Dependent Costs	376	388	6	2	-	22	11,784	1,901	14,479	14,048	430	-	-	304	-	-	-	-	-	6,080	10
1b.0	TOTAL PERIOD 1b COST	2,580	407	76	310	-	300	13,457	3,058	20,188	18,351	1,836	-	-	975	-	-	-	-	-	46,349	23,684
<b>PERIOD 1c - Preparations for SAFSTOR Dormancy</b>																						
Period 1c Direct Decommissioning Activities																						
1c.1.1	Prepare support equipment for storage	-	437	-	-	-	-	-	66	502	502	-	-	-	-	-	-	-	-	-	-	3,000
1c.1.2	Install containment pressure equal. lines	-	36	-	-	-	-	-	5	42	42	-	-	-	-	-	-	-	-	-	-	700
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	-	-	13,072
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	74	11	85	85	-	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	473	-	-	-	-	807	302	1,582	1,582	-	-	-	-	-	-	-	-	-	-	16,772
Period 1c Additional Costs																						
1c.2.1	Spent fuel pool isolation	-	-	-	-	-	-	11,087	1,663	12,750	12,750	-	-	-	-	-	-	-	-	-	-	-
1c.2.2	Asbestos Remediation	-	3,336	2	224	-	1,182	-	1,163	5,908	5,908	-	-	-	12,771	-	-	-	-	-	166,023	38,278
1c.2.3	Misc Hazardous Waste	-	-	611	193	4,947	-	-	832	6,583	6,583	-	-	23,332	-	-	-	-	-	-	1,232,428	4,905
1c.2	Subtotal Period 1c Additional Costs	-	3,336	613	418	4,947	1,182	11,087	3,659	25,241	25,241	-	-	23,332	12,771	-	-	-	-	-	1,398,451	43,183
Period 1c Collateral Costs																						
1c.3.1	Process decommissioning water waste	135	-	89	392	-	354	-	224	1,193	1,193	-	-	-	854	-	-	-	-	-	51,241	167
1c.3.3	Small tool allowance	-	40	-	-	-	-	-	6	46	46	-	-	-	-	-	-	-	-	-	-	-
1c.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,236	185	1,421	-	1,421	-	-	-	-	-	-	-	-	-	-
1c.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	27	3	29	29	-	-	-	-	-	-	-	-	-	-	-
1c.3.6	Fixed Overhead	-	-	-	-	-	-	454	68	522	522	-	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	135	40	89	392	-	354	1,716	486	3,212	1,790	1,421	-	-	854	-	-	-	-	-	51,241	167
Period 1c Period-Dependent Costs																						
1c.4.1	Insurance	-	-	-	-	-	-	360	36	396	396	-	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	112	11	123	123	-	-	-	-	-	-	-	-	-	-	-

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 1c Period-Dependent Costs (continued)																						
1c.4.3	Health physics supplies	-	381	-	-	-	-	-	95	476	476	-	-	-	-	-	-	-	-	-	-	
1c.4.4	Heavy equipment rental	-	180	-	-	-	-	-	27	207	207	-	-	-	-	-	-	-	-	-	-	
1c.4.5	Disposal of DAW generated	-	-	3	1	-	9	-	3	15	15	-	-	-	126	-	-	-	-	2,511	4	
1c.4.6	Plant energy budget	-	-	-	-	-	-	744	112	856	856	-	-	-	-	-	-	-	-	-	-	
1c.4.7	NRC Fees	-	-	-	-	-	-	175	17	192	192	-	-	-	-	-	-	-	-	-	-	
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	170	17	187	-	187	-	-	-	-	-	-	-	-	-	
1c.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	203	30	234	-	234	-	-	-	-	-	-	-	-	-	
1c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-	
1c.4.11	NEI Fees	-	-	-	-	-	-	92	9	102	102	-	-	-	-	-	-	-	-	-	-	
1c.4.12	Security Staff Cost	-	-	-	-	-	-	1,899	285	2,183	2,183	-	-	-	-	-	-	-	-	-	37,466	
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	8,113	1,217	9,330	9,330	-	-	-	-	-	-	-	-	-	107,880	
1c.4	Subtotal Period 1c Period-Dependent Costs	-	561	3	1	-	9	11,881	1,861	14,315	13,880	435	-	-	126	-	-	-	-	2,511	4	145,346
1c.0	TOTAL PERIOD 1c COST	135	4,410	704	811	4,947	1,545	25,491	6,308	44,350	42,494	1,856	-	23,332	13,751	-	-	-	-	1,452,203	60,126	145,929
<b>PERIOD 1 TOTALS</b>		<b>2,715</b>	<b>5,918</b>	<b>790</b>	<b>1,124</b>	<b>4,947</b>	<b>1,880</b>	<b>96,960</b>	<b>18,093</b>	<b>132,427</b>	<b>123,352</b>	<b>9,075</b>	<b>-</b>	<b>23,332</b>	<b>15,218</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,508,406</b>	<b>83,826</b>	<b>896,045</b>
<b>PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage</b>																						
Period 2a Direct Decommissioning Activities																						
2a.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2a.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2a.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2a.1.5	Maintenance supplies	-	-	-	-	-	-	560	140	700	700	-	-	-	-	-	-	-	-	-	-	
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	560	140	700	700	-	-	-	-	-	-	-	-	-	-	
Period 2a Collateral Costs																						
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	52,870	7,931	60,801	-	60,801	-	-	-	-	-	-	-	-	-	
2a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	
2a.3.3	Fixed Overhead	-	-	-	-	-	-	7,121	1,068	8,189	8,189	-	-	-	-	-	-	-	-	-	-	
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	59,992	8,999	68,991	8,190	60,801	-	-	-	-	-	-	-	-	-	
Period 2a Period-Dependent Costs																						
2a.4.1	Insurance	-	-	-	-	-	-	2,355	236	2,591	2,591	0	-	-	-	-	-	-	-	-	-	
2a.4.2	Property taxes	-	-	-	-	-	-	58	6	64	64	-	-	-	-	-	-	-	-	-	-	
2a.4.3	Health physics supplies	-	522	-	-	-	-	-	131	653	653	-	-	-	-	-	-	-	-	-	-	
2a.4.4	Disposal of DAW generated	-	-	12	4	-	42	-	12	70	70	-	-	-	586	-	-	-	-	-	-	
2a.4.5	Plant energy budget	-	-	-	-	-	-	2,336	350	2,687	1,343	1,343	-	-	-	-	-	-	-	11,711	19	
2a.4.6	NRC Fees	-	-	-	-	-	-	1,199	120	1,319	1,319	-	-	-	-	-	-	-	-	-	-	
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,834	183	2,017	-	2,017	-	-	-	-	-	-	-	-	-	
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	3,189	478	3,668	-	3,668	-	-	-	-	-	-	-	-	-	
2a.4.9	ISFSI Operating Costs	-	-	-	-	-	-	196	29	225	-	225	-	-	-	-	-	-	-	-	-	
2a.4.10	NEI Fees	-	-	-	-	-	-	1,449	145	1,594	-	1,594	-	-	-	-	-	-	-	-	-	
2a.4.11	Security Staff Cost	-	-	-	-	-	-	19,352	2,903	22,255	3,437	18,818	-	-	-	-	-	-	-	-	358,743	
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	12,381	1,857	14,238	4,397	9,841	-	-	-	-	-	-	-	-	154,343	
2a.4	Subtotal Period 2a Period-Dependent Costs	-	522	12	4	-	42	44,350	6,451	51,381	13,874	37,507	-	-	586	-	-	-	-	11,711	19	513,086
2a.0	TOTAL PERIOD 2a COST	-	522	12	4	-	42	104,902	15,589	121,072	22,764	98,308	-	-	586	-	-	-	-	11,711	19	513,086
<b>PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage</b>																						
Period 2b Direct Decommissioning Activities																						
2b.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2b.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2b.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2b.1.5	Maintenance supplies	-	-	-	-	-	-	4,893	1,223	6,116	6,116	-	-	-	-	-	-	-	-	-	-	
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	4,893	1,223	6,116	6,116	-	-	-	-	-	-	-	-	-	-	
Period 2b Collateral Costs																						
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	23,615	3,542	27,158	-	27,158	-	-	-	-	-	-	-	-	-	
2b.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	-	
2b.3.3	Fixed Overhead	-	-	-	-	-	-	12,453	1,868	14,321	14,321	-	-	-	-	-	-	-	-	-	-	
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	36,073	5,411	41,484	14,326	27,158	-	-	-	-	-	-	-	-	-	
Period 2b Period-Dependent Costs																						
2b.4.1	Insurance	-	-	-	-	-	-	20,592	2,059	22,651	-	22,651	-	-	-	-	-	-	-	-	-	
2b.4.2	Property taxes	-	-	-	-	-	-	505	51	556	556	-	-	-	-	-	-	-	-	-	-	

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2b Period-Dependent Costs (continued)																						
2b.4.3	Health physics supplies	-	2,305	-	-	-	-	-	576	2,881	2,881	-	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	54	18	-	185	-	54	311	311	-	-	-	2,591	-	-	-	-	51,830	85	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	10,214	1,532	11,746	11,746	-	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	10,035	1,004	11,039	11,039	-	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	16,034	1,603	17,637	-	17,637	-	-	-	-	-	-	-	-	-	-
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	1,712	257	1,969	-	1,969	-	-	-	-	-	-	-	-	-	-
2b.4.9	Security Staff Cost	-	-	-	-	-	-	74,875	11,231	86,106	30,053	56,053	-	-	-	-	-	-	-	-	-	1,531,920
2b.4.10	Utility Staff Cost	-	-	-	-	-	-	55,749	8,362	64,111	38,449	25,662	-	-	-	-	-	-	-	-	-	729,486
2b.4	Subtotal Period 2b Period-Dependent Costs	-	2,305	54	18	-	185	189,716	26,730	219,008	95,036	123,972	-	-	2,591	-	-	-	-	51,830	85	2,261,406
2b.0	TOTAL PERIOD 2b COST	-	2,305	54	18	-	185	230,683	33,364	266,608	115,479	151,130	-	-	2,591	-	-	-	-	51,830	85	2,261,406
<b>PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage</b>																						
Period 2c Direct Decommissioning Activities																						
2c.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	1,738	434	2,172	2,172	-	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	1,738	434	2,172	2,172	-	-	-	-	-	-	-	-	-	-	-
Period 2c Collateral Costs																						
2c.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	2	0	2	2	-	-	-	-	-	-	-	-	-	-	-
2c.3.2	Fixed Overhead	-	-	-	-	-	-	4,423	663	5,086	5,086	-	-	-	-	-	-	-	-	-	-	-
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	4,424	664	5,088	5,088	-	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																						
2c.4.1	Insurance	-	-	-	-	-	-	7,314	731	8,045	8,045	-	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	179	18	197	197	-	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	783	-	-	-	-	-	196	978	978	-	-	-	-	-	-	-	-	-	-	-
2c.4.4	Disposal of DAW generated	-	-	18	6	-	62	-	18	104	104	-	-	-	866	-	-	-	-	17,325	28	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	3,628	544	4,172	4,172	-	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	3,298	330	3,628	3,628	-	-	-	-	-	-	-	-	-	-	-
2c.4.7	Security Staff Cost	-	-	-	-	-	-	9,282	1,392	10,674	10,674	-	-	-	-	-	-	-	-	-	-	194,314
2c.4.8	Utility Staff Cost	-	-	-	-	-	-	11,875	1,781	13,656	13,656	-	-	-	-	-	-	-	-	-	-	165,297
2c.4	Subtotal Period 2c Period-Dependent Costs	-	783	18	6	-	62	35,575	5,010	41,454	41,454	-	-	-	866	-	-	-	-	17,325	28	359,611
2c.0	TOTAL PERIOD 2c COST	-	783	18	6	-	62	41,737	6,109	48,714	48,714	-	-	-	866	-	-	-	-	17,325	28	359,611
<b>PERIOD 2 TOTALS</b>																						
		-	3,610	85	28	-	288	377,322	55,062	436,394	186,957	249,438	-	-	4,043	-	-	-	-	80,865	132	3,134,102
<b>PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy</b>																						
Period 3a Direct Decommissioning Activities																						
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	584	88	672	672	-	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
3a.1.4	End product description	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	165	25	190	190	-	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	953	143	1,096	1,096	-	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	394	59	453	453	-	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	635	95	731	731	-	-	-	-	-	-	-	-	-	-	5,000
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	520	78	598	598	-	-	-	-	-	-	-	-	-	-	4,096
3a.1.10	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-
Activity Specifications																						
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	936	140	1,077	969	-	108	-	-	-	-	-	-	-	-	7,370
3a.1.11.2	Plant systems	-	-	-	-	-	-	529	79	609	548	-	61	-	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	902	135	1,037	1,037	-	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	826	124	950	950	-	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	64	10	73	73	-	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	396	59	456	456	-	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	203	30	234	117	-	117	-	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	51	8	58	-	-	58	-	-	-	-	-	-	-	-	400
3a.1.11.9	Main Condensers	-	-	-	-	-	-	51	8	58	-	-	58	-	-	-	-	-	-	-	-	400
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	396	59	456	228	-	228	-	-	-	-	-	-	-	-	3,120

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Activity Specifications (continued)																					
3a.1.11.11	Waste management	-	-	-	-	-	-	584	88	672	672	-	-	-	-	-	-	-	-	-	4,600
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	114	17	131	66	-	66	-	-	-	-	-	-	-	900
3a.1.11	Total	-	-	-	-	-	-	5,054	758	5,812	5,116	-	696	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	305	46	351	351	-	-	-	-	-	-	-	-	-	2,400
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	3,100	465	3,565	3,565	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,400
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	156	23	180	180	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	14,637	2,196	16,832	16,136	-	696	-	-	-	-	-	-	-	72,703
Period 3a Additional Costs																					
3a.2.1	Site Characterization	-	-	-	-	-	-	5,854	1,756	7,610	7,610	-	-	-	-	-	-	-	-	30,500	10,852
3a.2	Subtotal Period 3a Additional Costs	-	-	-	-	-	-	5,854	1,756	7,610	7,610	-	-	-	-	-	-	-	-	30,500	10,852
Period 3a Collateral Costs																					
3a.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
3a.3.2	Fixed Overhead	-	-	-	-	-	-	1,780	267	2,047	2,047	-	-	-	-	-	-	-	-	-	-
3a.3	Subtotal Period 3a Collateral Costs	-	-	-	-	-	-	1,781	267	2,048	2,048	-	-	-	-	-	-	-	-	-	-
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	589	59	648	648	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	14	1	16	16	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	331	-	-	-	-	-	83	414	414	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	706	-	-	-	-	-	106	812	812	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	8	3	-	28	-	8	48	48	-	-	398	-	-	-	-	7,951	13	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	2,920	438	3,358	3,358	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	385	38	423	423	-	-	-	-	-	-	-	-	-	-
3a.4.8	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-
3a.4.9	Security Staff Cost	-	-	-	-	-	-	1,441	216	1,657	1,657	-	-	-	-	-	-	-	-	-	37,814
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	19,980	2,997	22,978	22,978	-	-	-	-	-	-	-	-	-	258,629
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,037	8	3	-	28	25,692	3,983	30,752	30,752	-	-	398	-	-	-	-	7,951	13	296,443
3a.0	TOTAL PERIOD 3a COST	-	1,037	8	3	-	28	47,964	8,202	57,243	56,547	-	696	-	398	-	-	-	7,951	30,513	379,997
<b>PERIOD 3b - Decommissioning Preparations</b>																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	601	90	692	622	-	69	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	318	48	365	365	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	172	26	197	49	-	148	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	127	19	146	146	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	461	69	530	530	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	152	23	175	88	-	88	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	152	23	175	175	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	584	88	672	672	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	127	19	146	73	-	73	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	198	30	228	-	-	228	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	198	30	228	-	-	228	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	347	52	399	359	-	40	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	347	52	399	359	-	40	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	4,096	614	4,711	3,798	-	913	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	4,096	614	4,711	3,798	-	913	-	-	-	-	-	-	-	32,243
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	918	-	-	-	-	-	-	138	1,056	1,056	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,549	232	1,781	1,781	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-
3b.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	-
3b.3.5	Fixed Overhead	-	-	-	-	-	-	902	135	1,038	1,038	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	918	1,200	-	-	-	-	2,451	685	5,255	5,255	-	-	-	-	-	-	-	-	-	-

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 3b Period-Dependent Costs																						
3b.4.1	Decon supplies	28	-	-	-	-	-	-	7	36	36	-	-	-	-	-	-	-	-	-	-	
3b.4.2	Insurance	-	-	-	-	-	-	298	30	328	328	-	-	-	-	-	-	-	-	-	-	
3b.4.3	Property taxes	-	-	-	-	-	-	7	1	8	8	-	-	-	-	-	-	-	-	-	-	
3b.4.4	Health physics supplies	-	191	-	-	-	-	-	48	238	238	-	-	-	-	-	-	-	-	-	-	
3b.4.5	Heavy equipment rental	-	358	-	-	-	-	-	54	411	411	-	-	-	-	-	-	-	-	-	-	
3b.4.6	Disposal of DAW generated	-	-	5	2	-	17	-	5	28	28	-	-	-	236	-	-	-	-	4,714	8	
3b.4.7	Plant energy budget	-	-	-	-	-	-	1,480	222	1,702	1,702	-	-	-	-	-	-	-	-	-	-	
3b.4.8	NRC Fees	-	-	-	-	-	-	195	20	215	215	-	-	-	-	-	-	-	-	-	-	
3b.4.9	NEI Fees	-	-	-	-	-	-	184	18	202	202	-	-	-	-	-	-	-	-	-	-	
3b.4.10	Security Staff Cost	-	-	-	-	-	-	730	110	840	840	-	-	-	-	-	-	-	-	-	19,166	
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	5,024	754	5,777	5,777	-	-	-	-	-	-	-	-	-	59,200	
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	10,127	1,519	11,646	11,646	-	-	-	-	-	-	-	-	-	131,086	
3b.4	Subtotal Period 3b Period-Dependent Costs	28	548	5	2	-	17	18,046	2,786	21,432	21,432	-	-	-	236	-	-	-	-	4,714	8	209,452
3b.0	TOTAL PERIOD 3b COST	946	1,748	5	2	-	17	24,594	4,086	31,398	30,484	-	913	-	236	-	-	-	-	4,714	8	241,695
<b>PERIOD 3 TOTALS</b>		946	2,785	13	4	-	45	72,558	12,288	88,640	87,031	-	1,609	-	633	-	-	-	-	12,665	30,521	621,692
<b>PERIOD 4a - Large Component Removal</b>																						
Period 4a Direct Decommissioning Activities																						
Nuclear Steam Supply System Removal																						
4a.1.1.1	Reactor Coolant Piping	11	40	8	11	39	87	-	45	241	241	-	-	201	213	-	-	-	-	46,608	1,055	-
4a.1.1.2	Pressurizer Relief Tank	5	18	6	7	25	52	-	25	139	139	-	-	133	133	-	-	-	-	29,424	480	-
4a.1.1.3	Reactor Coolant Pumps & Motors	10	61	45	143	-	784	-	242	1,285	1,285	-	-	-	2,396	-	-	-	-	555,300	1,932	80
4a.1.1.4	Pressurizer	7	52	360	99	-	963	-	308	1,790	1,790	-	-	-	2,944	-	-	-	-	207,852	1,496	750
4a.1.1.5	Steam Generators	47	3,461	1,337	4,232	1,408	4,083	-	2,889	17,458	17,458	-	-	26,258	12,483	-	-	-	-	2,143,159	9,661	1,125
4a.1.1.6	Retired Steam Generator Units	-	-	645	3,937	-	4,083	-	1,676	10,341	10,341	-	-	-	12,483	-	-	-	-	1,364,708	2,380	1,125
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	27	195	198	68	48	345	-	186	1,067	1,067	-	-	753	2,540	-	-	-	-	124,734	4,544	-
4a.1.1.8	Reactor Vessel Internals	65	2,528	7,877	1,563	-	7,872	240	8,261	28,406	28,406	-	-	-	632	501	842	-	-	222,881	20,450	950
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	13,033	-	1,955	14,987	14,987	-	-	-	-	-	-	2,061	-	407,628	-	-
4a.1.1.10	Reactor Vessel	-	4,614	1,454	521	-	2,525	240	5,253	14,607	14,607	-	-	-	7,720	-	-	-	-	787,443	20,450	950
4a.1.1	Totals	172	10,968	11,931	10,582	1,520	33,828	480	20,841	90,321	90,321	-	-	27,344	41,544	501	842	2,061	-	5,889,738	62,447	4,980
Removal of Major Equipment																						
4a.1.2	Main Turbine/Generator	-	257	100	34	372	-	-	135	898	898	-	-	4,778	-	-	-	-	-	215,018	5,346	-
4a.1.3	Main Condensers	-	869	116	39	431	-	-	299	1,754	1,754	-	-	5,535	-	-	-	-	-	249,061	18,250	-
Cascading Costs from Clean Building Demolition																						
4a.1.4.1	Containment	-	734	-	-	-	-	-	110	844	844	-	-	-	-	-	-	-	-	-	8,127	-
4a.1.4.2	Fuel Handling	-	56	-	-	-	-	-	8	64	64	-	-	-	-	-	-	-	-	-	663	-
4a.1.4	Totals	-	790	-	-	-	-	-	118	908	908	-	-	-	-	-	-	-	-	-	8,790	-
Disposal of Plant Systems																						
4a.1.5.1	Amertap	-	77	-	-	-	-	-	12	88	-	-	88	-	-	-	-	-	-	-	1,715	-
4a.1.5.2	Auxiliary Feedwater	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	-	98	-
4a.1.5.3	Auxiliary Feedwater - Insulated	-	18	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	-	411	-
4a.1.5.4	Auxiliary Feedwater - Insulated - RCA	-	120	1	4	48	-	-	38	211	211	-	-	684	-	-	-	-	-	27,785	2,343	-
4a.1.5.5	Auxiliary Feedwater - RCA	-	27	0	1	12	-	-	9	48	48	-	-	166	-	-	-	-	-	6,761	510	-
4a.1.5.6	Auxiliary Steam	-	0	-	-	-	-	-	0	0	-	-	0	-	-	-	-	-	-	-	10	-
4a.1.5.7	Auxiliary Steam - Insulated	-	31	-	-	-	-	-	5	36	-	-	36	-	-	-	-	-	-	-	734	-
4a.1.5.8	Auxiliary Steam - Insulated - RCA	-	7	0	0	4	-	-	2	13	13	-	-	56	-	-	-	-	-	2,259	126	-
4a.1.5.9	Auxiliary Steam - RCA	-	0	0	0	0	-	-	0	0	0	-	-	0	-	-	-	-	-	15	1	-
4a.1.5.10	Breathing Air - Insulated - RCA	-	5	0	0	2	-	-	1	8	8	-	-	22	-	-	-	-	-	900	93	-
4a.1.5.11	Breathing Air - RCA	-	16	0	1	6	-	-	5	28	28	-	-	87	-	-	-	-	-	3,546	313	-
4a.1.5.12	Chemical & Volume Control	-	92	11	18	59	98	-	60	337	337	-	-	839	420	-	-	-	-	61,539	1,874	-
4a.1.5.13	Chemical & Volume Control - Insulated	-	253	17	23	21	164	-	112	590	590	-	-	298	694	-	-	-	-	58,054	4,930	-
4a.1.5.14	Circulating Water	-	95	-	-	-	-	-	14	110	-	-	110	-	-	-	-	-	-	-	2,204	-
4a.1.5.15	Component Cooling Water	-	154	-	-	-	-	-	23	177	-	-	177	-	-	-	-	-	-	-	3,558	-
4a.1.5.16	Component Cooling Water - RCA	-	343	9	37	409	-	-	154	951	951	-	-	5,822	-	-	-	-	-	236,429	6,736	-
4a.1.5.17	Condensate	-	175	-	-	-	-	-	26	201	-	-	201	-	-	-	-	-	-	-	3,960	-
4a.1.5.18	Condensate - Insulated	-	55	-	-	-	-	-	8	64	-	-	64	-	-	-	-	-	-	-	1,309	-
4a.1.5.19	Condensate Polishing	-	33	-	-	-	-	-	5	38	-	-	38	-	-	-	-	-	-	-	734	-
4a.1.5.20	Condensate Polishing - Ins	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	-	1,986	-
4a.1.5.21	Condensate Recovery	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	-	373	-
4a.1.5.22	Condensate Recovery - Insulated	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	60	-

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4a.1.5.23	Condensate Recovery - Insulated - RCA	-	5	0	0	2	-	-	2	9	9	-	-	26	-	-	-	-	1,045	96	-
4a.1.5.24	Condensate Recovery - RCA	-	21	0	1	8	-	-	6	36	36	-	-	115	-	-	-	-	4,669	388	-
4a.1.5.25	Condensate Storage	-	71	-	-	-	-	-	11	82	-	-	82	-	-	-	-	-	-	1,572	-
4a.1.5.26	Condenser	-	23	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	545	-
4a.1.5.27	Containment Post Accident Eval	-	1	0	0	0	-	-	0	1	1	-	-	3	-	-	-	-	127	14	-
4a.1.5.28	Containment Purge	-	45	2	6	68	-	-	23	143	143	-	-	972	-	-	-	-	39,455	864	-
4a.1.5.29	Electrical - Clean	-	1,405	-	-	-	-	-	211	1,616	-	-	1,616	-	-	-	-	-	-	31,193	-
4a.1.5.30	Extraction Steam	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	244	-
4a.1.5.31	Extraction Steam - Insulated	-	50	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	1,194	-
4a.1.5.32	Feedwater	-	49	-	-	-	-	-	7	56	-	-	56	-	-	-	-	-	-	1,095	-
4a.1.5.33	Feedwater - Insulated	-	141	-	-	-	-	-	21	162	-	-	162	-	-	-	-	-	-	3,321	-
4a.1.5.34	Feedwater - Insulated - RCA	-	62	1	6	65	-	-	26	160	160	-	-	918	-	-	-	-	37,298	1,233	-
4a.1.5.35	Feedwater - RCA	-	6	0	1	6	-	-	2	14	14	-	-	81	-	-	-	-	3,290	109	-
4a.1.5.36	Feedwater Heater Drains & Vents	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,053	-
4a.1.5.37	Feedwater Heater Drains & Vents - Ins	-	310	-	-	-	-	-	46	356	-	-	356	-	-	-	-	-	-	7,237	-
4a.1.5.38	Generator	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	126	-
4a.1.5.39	Generator - Insulated	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	47	-
4a.1.5.40	Instrument Air	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	291	-
4a.1.5.41	Instrument Air - Insulated	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	239	-
4a.1.5.42	Intake Cooling Water	-	151	-	-	-	-	-	23	173	-	-	173	-	-	-	-	-	-	3,548	-
4a.1.5.43	Main Steam - Insulated	-	170	-	-	-	-	-	25	195	-	-	195	-	-	-	-	-	-	3,903	-
4a.1.5.44	Main Steam - Insulated - RCA	-	42	1	4	48	-	-	18	114	114	-	-	684	-	-	-	-	27,764	840	-
4a.1.5.45	Safety Injection	-	197	6	24	271	-	-	94	593	593	-	-	3,856	-	-	-	-	156,576	4,102	-
4a.1.5.46	Safety Injection - Insulated	-	107	2	7	78	-	-	40	233	233	-	-	1,107	-	-	-	-	44,965	2,071	-
4a.1.5.47	Safety Injection Accumulator	-	206	5	21	238	-	-	91	562	562	-	-	3,388	-	-	-	-	137,605	4,075	-
4a.1.5.48	Sample - NSSS	-	22	0	1	8	-	-	7	38	38	-	-	120	-	-	-	-	4,856	467	-
4a.1.5.49	Sample - NSSS - Ins	-	21	0	0	3	-	-	6	30	30	-	-	42	-	-	-	-	1,710	463	-
4a.1.5.50	Screen Wash	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	531	-
4a.1.5.51	Secondary Sample	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	83	-
4a.1.5.52	Secondary Sample - RCA	-	5	0	0	2	-	-	2	9	9	-	-	35	-	-	-	-	1,436	96	-
4a.1.5.53	Secondary Wet Layup	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	503	-
4a.1.5.54	Secondary Wet Layup - RCA	-	18	0	1	10	-	-	6	35	35	-	-	140	-	-	-	-	5,685	337	-
4a.1.5.55	Turbine Building HVAC	-	17	-	-	-	-	-	3	20	-	-	20	-	-	-	-	-	-	409	-
4a.1.5.56	Turbine Lube Oil	-	40	-	-	-	-	-	6	47	-	-	47	-	-	-	-	-	-	906	-
4a.1.5.57	Turbine Plant Chemical Addition	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	77	-
4a.1.5.58	Turbine Plant Cooling Water	-	86	-	-	-	-	-	13	99	-	-	99	-	-	-	-	-	-	1,975	-
4a.1.5.59	Turbine Plant Cooling Water - Insulated	-	48	-	-	-	-	-	7	55	-	-	55	-	-	-	-	-	-	1,107	-
4a.1.5.60	Turbine Steam	-	64	-	-	-	-	-	10	74	-	-	74	-	-	-	-	-	-	1,496	-
4a.1.5.61	Turbine Steam - Insulated	-	28	-	-	-	-	-	4	33	-	-	33	-	-	-	-	-	-	669	-
4a.1.5	Totals	-	5,157	57	158	1,367	261	-	1,235	8,235	4,163	-	4,072	19,462	1,114	-	-	-	863,769	112,595	-
4a.1.6	Scaffolding in support of decommissioning	-	162	3	1	11	3	-	44	225	225	-	-	146	13	-	-	-	7,439	3,969	-
4a.1	Subtotal Period 4a Activity Costs	172	18,203	12,208	10,813	3,701	34,092	480	22,672	102,342	98,270	-	4,072	57,266	42,671	501	842	2,061	7,225,026	211,398	4,980
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,331	399	1,731	1,731	-	-	-	-	-	-	-	-	25,228	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,331	399	1,731	1,731	-	-	-	-	-	-	-	-	25,228	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	3	-	5	24	-	22	-	11	66	66	-	-	-	53	-	-	-	3,153	10	-
4a.3.3	Small tool allowance	-	191	-	-	-	-	-	29	220	198	-	22	-	-	-	-	-	-	-	-
4a.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	95	10	105	105	-	-	-	-	-	-	-	-	-	-
4a.3.5	Fixed Overhead	-	-	-	-	-	-	2,161	324	2,485	2,485	-	-	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	3	191	5	24	-	22	2,256	374	2,875	2,853	-	22	-	53	-	-	-	3,153	10	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	68	-	-	-	-	-	-	17	85	85	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	715	71	786	786	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	18	2	19	17	-	2	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,566	-	-	-	-	-	391	1,957	1,957	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	3,089	-	-	-	-	-	463	3,552	3,552	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	58	19	-	195	-	57	329	329	-	-	-	2,741	-	-	-	54,821	89	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	3,367	505	3,872	3,872	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	-	73	803	803	-	-	-	-	-	-	-	-	-	-
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	490	73	563	563	-	-	-	-	-	-	-	-	-	-
4a.4.10	NEI Fees	-	-	-	-	-	-	440	44	484	484	-	-	-	-	-	-	-	-	-	-

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 4a Period-Dependent Costs (continued)																						
4a.4.11	Security Staff Cost	-	-	-	-	-	-	1,977	296	2,273	2,273	-	-	-	-	-	-	-	-	-	53,160	
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	14,402	2,160	16,563	16,563	-	-	-	-	-	-	-	-	-	171,909	
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	22,449	3,367	25,817	25,817	-	-	-	-	-	-	-	-	-	298,557	
4a.4	Subtotal Period 4a Period-Dependent Costs	68	4,654	58	19	-	195	44,587	7,522	57,104	57,102	-	2	-	2,741	-	-	-	-	54,821	89	523,626
4a.0	TOTAL PERIOD 4a COST	243	23,049	12,271	10,856	3,701	34,309	48,655	30,967	164,051	159,956	-	4,096	57,266	45,464	501	842	2,061	7,283,000	236,726	528,606	
<b>PERIOD 4b - Site Decontamination</b>																						
Period 4b Direct Decommissioning Activities																						
4b.1.1	Remove spent fuel racks	384	42	161	115	-	874	-	454	2,029	2,029	-	-	-	3,714	-	-	-	-	245,474	1,023	-
Disposal of Plant Systems																						
4b.1.2.1	Containment Emergency Filter	-	5	0	0	3	-	-	2	10	10	-	-	47	-	-	-	-	-	1,929	99	-
4b.1.2.2	Containment Normal & Emerg Cooling	-	538	12	47	524	-	-	221	1,342	1,342	-	-	7,456	-	-	-	-	-	302,798	9,308	-
4b.1.2.3	Containment Normal & Emerg Cooling - Ins	-	4	0	0	2	-	-	1	8	8	-	-	28	-	-	-	-	-	1,139	71	-
4b.1.2.4	Containment Spray	-	69	1	5	56	-	-	26	157	157	-	-	792	-	-	-	-	-	32,145	1,311	-
4b.1.2.5	Containment Spray - Insulated	-	54	1	3	30	-	-	19	107	107	-	-	432	-	-	-	-	-	17,525	1,007	-
4b.1.2.6	EDG Building HVAC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	39	-
4b.1.2.7	Electrical - Contaminated	-	205	3	10	116	-	-	71	405	405	-	-	1,656	-	-	-	-	-	67,265	3,933	-
4b.1.2.8	Electrical - Decontaminated	-	1,854	24	95	1,056	-	-	638	3,667	3,667	-	-	15,032	-	-	-	-	-	610,470	35,513	-
4b.1.2.9	Emergency Diesel Engine & Oil	-	68	-	-	-	-	-	10	78	-	-	78	-	-	-	-	-	-	-	1,507	-
4b.1.2.10	Emergency Diesel Engine & Oil - Ins	-	3	-	-	-	-	-	0	3	-	-	3	-	-	-	-	-	-	-	62	-
4b.1.2.11	Fire Protection	-	16	-	-	-	-	-	2	19	-	-	19	-	-	-	-	-	-	-	394	-
4b.1.2.12	Fire Protection - RCA	-	96	1	4	46	-	-	31	178	178	-	-	652	-	-	-	-	-	26,473	1,701	-
4b.1.2.13	Fuel Handling HVAC	-	51	1	4	49	-	-	21	126	126	-	-	697	-	-	-	-	-	28,296	908	-
4b.1.2.14	Instrument Air - Insulated - RCA	-	63	0	2	20	-	-	19	104	104	-	-	280	-	-	-	-	-	11,377	1,259	-
4b.1.2.15	Instrument Air - RCA	-	37	0	1	12	-	-	11	62	62	-	-	177	-	-	-	-	-	7,206	730	-
4b.1.2.16	Miscellaneous - RCA	-	6	0	1	14	-	-	4	26	26	-	-	206	-	-	-	-	-	8,368	128	-
4b.1.2.17	Primary Water Makeup	-	76	-	-	-	-	-	11	88	-	-	88	-	-	-	-	-	-	-	1,691	-
4b.1.2.18	Reactor Coolant - Insulated	-	72	4	6	7	43	-	31	163	163	-	-	104	182	-	-	-	-	16,229	1,422	-
4b.1.2.19	Refueling Equipment	-	126	9	16	75	72	-	64	362	362	-	-	1,061	307	-	-	-	-	63,384	2,633	-
4b.1.2.20	Residual Heat Removal	-	74	64	94	171	596	-	213	1,211	1,211	-	-	2,432	2,527	-	-	-	-	266,066	1,642	-
4b.1.2.21	Residual Heat Removal - Insulated	-	227	30	47	106	282	-	153	845	845	-	-	1,506	1,198	-	-	-	-	140,459	4,555	-
4b.1.2.22	Service Water	-	0	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	10	-
4b.1.2.23	Service Water - RCA	-	4	0	0	3	-	-	1	9	9	-	-	44	-	-	-	-	-	1,802	73	-
4b.1.2.24	Spent Fuel Pool Cooling	-	99	12	18	29	117	-	62	338	338	-	-	414	498	-	-	-	-	49,784	1,944	-
4b.1.2.25	Spent Fuel Pool Cooling - Insulated	-	48	5	7	9	46	-	26	142	142	-	-	135	197	-	-	-	-	18,542	921	-
4b.1.2.26	Steam Generator Wet Layup	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	25	-
4b.1.2.27	Steam Generator Wet Layup - RCA	-	1	0	0	1	-	-	0	3	3	-	-	10	-	-	-	-	-	396	25	-
4b.1.2.28	Waste Disposal	-	35	3	4	8	24	-	17	90	90	-	-	109	102	-	-	-	-	11,152	683	-
4b.1.2.29	Waste Disposal - Insulated	-	77	6	9	8	61	-	37	198	198	-	-	108	258	-	-	-	-	21,441	1,476	-
4b.1.2	Totals	-	3,910	177	374	2,345	1,241	-	1,697	9,744	9,553	-	191	33,380	5,269	-	-	-	-	1,704,245	75,072	-
4b.1.3	Scaffolding in support of decommissioning	-	244	5	2	17	5	-	65	338	338	-	-	220	19	-	-	-	-	11,158	5,954	-
Decontamination of Site Buildings																						
4b.1.4.1	Containment	777	975	49	637	158	1,223	-	1,062	4,880	4,880	-	-	2,253	15,142	-	-	-	-	1,295,734	32,527	-
4b.1.4.2	LLW Storage Area Soil Disposal	-	95	214	3,699	-	4,933	-	1,833	10,775	10,775	-	-	-	81,327	-	-	-	-	7,047,000	1,409	-
4b.1.4.3	Fuel Handling	300	353	4	20	92	27	-	262	1,058	1,058	-	-	1,306	298	-	-	-	-	77,447	13,019	-
4b.1.4	Totals	1,076	1,424	267	4,356	250	6,183	-	3,157	16,713	16,713	-	-	3,560	96,767	-	-	-	-	8,420,181	46,955	-
4b.1	Subtotal Period 4b Activity Costs	1,460	5,618	610	4,847	2,612	8,303	-	5,374	28,824	28,633	-	191	37,159	105,769	-	-	-	-	10,381,060	129,004	-
Period 4b Additional Costs																						
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,098	330	1,428	1,428	-	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,897	869	3,766	3,766	-	-	-	-	-	-	-	-	-	54,899	-
4b.2.3	Seaweed Remediation & Disposal	-	45	1	374	-	415	-	171	1,008	1,008	-	-	-	29,650	-	-	-	-	593,000	494	-
4b.2.4	Decommissioning of ISFSI	-	317	2	492	-	726	1,533	768	3,838	3,838	-	-	-	10,693	-	-	-	-	1,561,386	10,512	4,626
4b.2	Subtotal Period 4b Additional Costs	-	363	4	866	-	1,141	5,528	2,138	10,039	10,039	-	-	-	40,343	-	-	-	-	2,154,386	65,905	10,866
Period 4b Collateral Costs																						
4b.3.1	Process decommissioning water waste	8	-	13	58	-	52	-	27	157	157	-	-	-	126	-	-	-	-	7,534	24	-
4b.3.3	Small tool allowance	-	111	-	-	-	-	-	17	127	127	-	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	138	68	467	124	-	125	923	923	-	-	6,000	529	-	-	-	-	304,968	88	-
4b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	292	29	321	321	-	-	-	-	-	-	-	-	-	-	-
4b.3.6	Fixed Overhead	-	-	-	-	-	-	4,702	705	5,407	5,407	-	-	-	-	-	-	-	-	-	-	-

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
4b.3	Subtotal Period 4b Collateral Costs	8	111	151	125	467	177	4,993	903	6,935	6,935	-	-	6,000	655	-	-	-	312,502	113	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	510	-	-	-	-	-	-	128	638	638	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	1,536	154	1,690	1,690	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	38	4	42	42	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,799	-	-	-	-	-	450	2,248	2,248	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	6,901	-	-	-	-	-	1,035	7,936	7,936	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	59	20	-	202	-	59	340	340	-	-	-	2,831	-	-	-	56,627	92	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	5,785	868	6,653	6,653	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,589	159	1,748	1,748	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	1,066	160	1,226	1,226	-	-	-	-	-	-	-	-	-	-
4b.4.10	NEI Fees	-	-	-	-	-	-	957	96	1,053	1,053	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	4,301	645	4,946	4,946	-	-	-	-	-	-	-	-	-	115,680
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	20,994	3,149	24,143	24,143	-	-	-	-	-	-	-	-	-	258,903
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	34,327	5,149	39,476	39,476	-	-	-	-	-	-	-	-	-	462,720
4b.4	Subtotal Period 4b Period-Dependent Costs	510	8,700	59	20	-	202	70,593	12,055	92,139	92,139	-	-	-	2,831	-	-	-	56,627	92	837,303
4b.0	TOTAL PERIOD 4b COST	1,978	14,792	824	5,858	3,079	9,822	81,115	20,469	137,936	137,745	-	191	43,159	149,598	-	-	-	12,904,570	195,114	848,169
<b>PERIOD 4e - Delay before License Termination</b>																					
Period 4e Direct Decommissioning Activities																					
Period 4e Collateral Costs																					
4e.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-
4e.3.2	Fixed Overhead	-	-	-	-	-	-	1,819	273	2,092	2,092	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,819	273	2,092	2,092	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.2	Property taxes	-	-	-	-	-	-	15	1	16	16	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	65	-	-	-	-	-	16	81	81	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	2	0	-	5	-	2	9	9	-	-	-	72	-	-	-	1,441	2	-
4e.4.6	NRC Fees	-	-	-	-	-	-	271	27	298	298	-	-	-	-	-	-	-	-	-	-
4e.4.7	NEI Fees	-	-	-	-	-	-	370	37	407	407	-	-	-	-	-	-	-	-	-	-
4e.4.8	Utility Staff Cost	-	-	-	-	-	-	1,104	166	1,270	1,270	-	-	-	-	-	-	-	-	-	14,920
4e.4	Subtotal Period 4e Period-Dependent Costs	-	65	2	0	-	5	1,761	249	2,082	2,082	-	-	-	72	-	-	-	1,441	2	14,920
4e.0	TOTAL PERIOD 4e COST	-	65	2	0	-	5	3,580	522	4,174	4,174	-	-	-	72	-	-	-	1,441	2	14,920
<b>PERIOD 4f - License Termination</b>																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	162	49	210	210	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	162	49	210	210	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	2,665	799	3,464	3,464	-	-	-	-	-	-	-	-	-	42,348
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	2,665	799	3,464	3,464	-	-	-	-	-	-	-	-	-	42,348
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,549	232	1,781	1,781	-	-	-	-	-	-	-	-	-	-
4f.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	-
4f.3.3	Fixed Overhead	-	-	-	-	-	-	1,341	201	1,542	1,542	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	2,890	434	3,324	3,324	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.2	Property taxes	-	-	-	-	-	-	11	1	12	12	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	335	-	-	-	-	-	84	419	419	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	5	2	-	18	-	5	30	30	-	-	-	247	-	-	-	4,938	8	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	440	66	506	506	-	-	-	-	-	-	-	-	-	-
4f.4.6	NRC Fees	-	-	-	-	-	-	454	45	499	499	-	-	-	-	-	-	-	-	-	-
4f.4.7	NEI Fees	-	-	-	-	-	-	273	27	300	300	-	-	-	-	-	-	-	-	-	-
4f.4.8	Security Staff Cost	-	-	-	-	-	-	500	75	575	575	-	-	-	-	-	-	-	-	-	11,786
4f.4.9	DOC Staff Cost	-	-	-	-	-	-	3,882	582	4,464	4,464	-	-	-	-	-	-	-	-	-	46,750
4f.4.10	Utility Staff Cost	-	-	-	-	-	-	4,810	722	5,532	5,532	-	-	-	-	-	-	-	-	-	56,964
4f.4	Subtotal Period 4f Period-Dependent Costs	-	335	5	2	-	18	10,370	1,608	12,337	12,337	-	-	-	247	-	-	-	4,938	8	115,500

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
4f.0	TOTAL PERIOD 4f COST	-	335	5	2	-	18	16,087	2,889	19,336	19,336	-	-	-	247	-	-	-	4,938	42,356	118,620
<b>PERIOD 4 TOTALS</b>		<b>2,221</b>	<b>38,240</b>	<b>13,102</b>	<b>16,716</b>	<b>6,781</b>	<b>44,153</b>	<b>149,437</b>	<b>54,847</b>	<b>325,497</b>	<b>321,211</b>	<b>-</b>	<b>4,287</b>	<b>100,425</b>	<b>195,381</b>	<b>501</b>	<b>842</b>	<b>2,061</b>	<b>20,193,950</b>	<b>474,198</b>	<b>1,510,315</b>
<b>PERIOD 5b - Site Restoration</b>																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Containment	-	4,220	-	-	-	-	-	633	4,853	-	-	4,853	-	-	-	-	-	-	47,090	-
5b.1.1.2	Miscellaneous Structures	-	188	-	-	-	-	-	28	216	-	-	216	-	-	-	-	-	-	2,629	-
5b.1.1.3	Sealwell	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	1,251	-
5b.1.1.4	Security Improvements	-	305	-	-	-	-	-	46	351	-	-	351	-	-	-	-	-	-	2,380	-
5b.1.1.5	Turbine	-	440	-	-	-	-	-	66	506	-	-	506	-	-	-	-	-	-	6,821	-
5b.1.1.6	Turbine Pedestal	-	488	-	-	-	-	-	73	561	-	-	561	-	-	-	-	-	-	5,055	-
5b.1.1.7	Fuel Handling	-	527	-	-	-	-	-	79	606	-	-	606	-	-	-	-	-	-	6,475	-
5b.1.1	Totals	-	6,271	-	-	-	-	-	941	7,211	-	-	7,211	-	-	-	-	-	-	71,701	-
Site Closeout Activities																					
5b.1.2	Grade & landscape site	-	421	-	-	-	-	-	63	484	-	-	484	-	-	-	-	-	-	921	-
5b.1.3	Final report to NRC	-	-	-	-	-	-	198	30	228	228	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	6,691	-	-	-	-	198	1,033	7,923	228	-	7,695	-	-	-	-	-	-	72,622	1,560
Period 5b Additional Costs																					
5b.2.1	Concrete Crushing	-	234	-	-	-	-	3	36	273	-	-	273	-	-	-	-	-	-	1,158	-
5b.2.2	Demolition of ISFSI	-	594	-	-	-	-	28	93	715	-	-	715	-	-	-	-	-	-	3,106	80
5b.2	Subtotal Period 5b Additional Costs	-	828	-	-	-	-	32	129	988	-	-	988	-	-	-	-	-	-	4,264	80
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	63	-	-	-	-	-	9	72	-	-	72	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.2	Property taxes	-	-	-	-	-	-	28	3	30	-	-	30	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,874	-	-	-	-	-	1,031	7,906	-	-	7,906	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	558	84	642	-	-	642	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	1,161	174	1,335	-	-	1,335	-	-	-	-	-	-	-	26,444
5b.4.6	DOC Staff Cost	-	-	-	-	-	-	9,515	1,427	10,942	-	-	10,942	-	-	-	-	-	-	-	105,697
5b.4.7	Utility Staff Cost	-	-	-	-	-	-	4,460	669	5,129	-	-	5,129	-	-	-	-	-	-	-	51,851
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,874	-	-	-	-	15,722	3,388	25,985	-	-	25,985	-	-	-	-	-	-	-	183,993
5b.0	TOTAL PERIOD 5b COST	-	14,456	-	-	-	-	15,952	4,560	34,968	228	-	34,740	-	-	-	-	-	-	76,886	185,633
<b>PERIOD 5 TOTALS</b>		<b>-</b>	<b>14,456</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>15,952</b>	<b>4,560</b>	<b>34,968</b>	<b>228</b>	<b>-</b>	<b>34,740</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>76,886</b>	<b>185,633</b>
<b>TOTAL COST TO DECOMMISSION</b>		<b>5,882</b>	<b>65,010</b>	<b>13,990</b>	<b>17,873</b>	<b>11,728</b>	<b>46,366</b>	<b>712,228</b>	<b>144,849</b>	<b>1,017,926</b>	<b>718,777</b>	<b>258,513</b>	<b>40,637</b>	<b>123,756</b>	<b>215,276</b>	<b>501</b>	<b>842</b>	<b>2,061</b>	<b>21,795,890</b>	<b>665,562</b>	<b>6,347,787</b>

**Table D-1**  
**Turkey Point Nuclear Plant, Unit 3**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A	Class B	Class C	GTCC			

<b>TOTAL COST TO DECOMMISSION WITH 16.59% CONTINGENCY:</b>					<b>\$1,017,926</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL NRC LICENSE TERMINATION COST IS 70.61% OR:</b>					<b>\$718,777</b>	<b>thousands of 2015 dollars</b>
<b>SPENT FUEL MANAGEMENT COST IS 25.4% OR:</b>					<b>\$258,513</b>	<b>thousands of 2015 dollars</b>
<b>NON-NUCLEAR DEMOLITION COST IS 3.99% OR:</b>					<b>\$40,637</b>	<b>thousands of 2015 dollars</b>
<b>TOTAL LOW LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):</b>					<b>216,618</b>	<b>cubic feet</b>
<b>TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:</b>					<b>2,061</b>	<b>cubic feet</b>
<b>TOTAL SCRAP METAL REMOVED:</b>					<b>32,572</b>	<b>tons</b>
<b>TOTAL CRAFT LABOR REQUIREMENTS:</b>					<b>665,562</b>	<b>man-hours</b>

End Notes:  
n/a - indicates that this activity not charged as decommissioning expense.  
a - indicates that this activity performed by decommissioning staff.  
0 - indicates that this value is less than 0.5 but is non-zero.  
a cell containing " - " indicates a zero value

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
<b>PERIOD 1a - Shutdown through Transition</b>																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	407	122	529	529	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	556
1a.1.3	Notification of Cessation of Operations	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.4	Remove fuel & source material	-	-	-	-	-	-	-	-	n/a	-	-	-	-	-	-	-	-	-	-	-
1a.1.5	Notification of Permanent Defueling	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.6	Deactivate plant systems & process waste	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	109	16	125	125	-	-	-	-	-	-	-	-	-	856
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	556
1a.1.9	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1a.1.11	End product description	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	82	12	94	94	-	-	-	-	-	-	-	-	-	642
1a.1.13	Define major work sequence	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428
1a.1.14	Perform SER and EA	-	-	-	-	-	-	169	25	194	194	-	-	-	-	-	-	-	-	-	1,327
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	2,140
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	268	40	308	308	-	-	-	-	-	-	-	-	-	2,106
1a.1.16.2	Plant systems	-	-	-	-	-	-	227	34	261	261	-	-	-	-	-	-	-	-	-	1,783
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	1,335
1a.1.16.4	Waste management	-	-	-	-	-	-	109	16	125	125	-	-	-	-	-	-	-	-	-	856
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	109	16	125	125	-	-	-	-	-	-	-	-	-	856
1a.1.16	Total	-	-	-	-	-	-	881	132	1,013	1,013	-	-	-	-	-	-	-	-	-	6,936
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	64	10	74	74	-	-	-	-	-	-	-	-	-	506
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	514
1a.1.17	Total	-	-	-	-	-	-	130	19	149	149	-	-	-	-	-	-	-	-	-	1,020
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	5	1	6	6	-	-	-	-	-	-	-	-	-	43
1a.1.19	Drain/de-energize non-cont. systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.20	Drain & dry NSSS	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.21	Drain/de-energize contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1.22	Decon/secure contaminated systems	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	2,359	415	2,774	2,774	-	-	-	-	-	-	-	-	-	15,361
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	1,128	169	1,297	-	1,297	-	-	-	-	-	-	-	-	-
1a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
1a.3.3	Fixed Overhead	-	-	-	-	-	-	1,780	267	2,047	2,047	-	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	2,909	436	3,345	2,048	1,297	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,271	127	1,398	1,398	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	408	41	448	448	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	371	-	-	-	-	-	93	464	464	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	706	-	-	-	-	-	106	812	812	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	10	3	-	33	-	10	55	55	-	-	458	-	-	-	-	9,158	15	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	2,920	438	3,358	3,358	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	823	82	905	905	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	667	67	734	-	734	-	-	-	-	-	-	-	-	-
1a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	797	120	917	-	917	-	-	-	-	-	-	-	-	-
1a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	49	7	56	-	56	-	-	-	-	-	-	-	-	-
1a.4.11	INPO Fees	-	-	-	-	-	-	840	84	924	924	-	-	-	-	-	-	-	-	-	-
1a.4.12	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-
1a.4.13	Security Staff Cost	-	-	-	-	-	-	4,838	726	5,564	5,564	-	-	-	-	-	-	-	-	-	89,686
1a.4.14	Utility Staff Cost	-	-	-	-	-	-	26,756	4,013	30,770	30,770	-	-	-	-	-	-	-	-	-	363,144
1a.4	Subtotal Period 1a Period-Dependent Costs	-	1,077	10	3	-	33	39,732	5,950	46,804	45,097	1,707	-	458	-	-	-	-	9,158	15	452,829
1a.0	TOTAL PERIOD 1a COST	-	1,077	10	3	-	33	45,000	6,801	52,923	49,919	3,004	-	458	-	-	-	-	9,158	15	468,190

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
<b>PERIOD 1b - SAFSTOR Limited DECON Activities</b>																						
Period 1b Direct Decommissioning Activities																						
Decontamination of Site Buildings																						
1b.1.1.1	Containment	849	-	-	-	-	-	-	424	1,273	1,273	-	-	-	-	-	-	-	-	-	17,275	-
1b.1.1.2	Auxiliary	390	-	-	-	-	-	-	195	585	585	-	-	-	-	-	-	-	-	-	8,218	-
1b.1.1.3	LLW Storage Bldg B&C Waste	13	-	-	-	-	-	-	6	19	19	-	-	-	-	-	-	-	-	-	272	-
1b.1.1.4	Radwaste Solidification	121	-	-	-	-	-	-	61	182	182	-	-	-	-	-	-	-	-	-	2,515	-
1b.1.1.5	Fuel Handling	330	-	-	-	-	-	-	165	496	496	-	-	-	-	-	-	-	-	-	6,269	-
1b.1.1	Totals	1,704	-	-	-	-	-	-	852	2,555	2,555	-	-	-	-	-	-	-	-	-	34,547	-
1b.1	Subtotal Period 1b Activity Costs	1,704	-	-	-	-	-	-	852	2,555	2,555	-	-	-	-	-	-	-	-	-	34,547	-
Period 1b Collateral Costs																						
1b.3.1	Decon equipment	918	-	-	-	-	-	-	138	1,056	1,056	-	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process decommissioning water waste	113	-	74	328	-	296	-	187	999	999	-	-	-	715	-	-	-	-	-	42,875	139
1b.3.4	Small tool allowance	-	28	-	-	-	-	-	4	32	32	-	-	-	-	-	-	-	-	-	-	-
1b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	2	0	3	3	-	-	-	-	-	-	-	-	-	-	-
1b.3.6	Fixed Overhead	-	-	-	-	-	-	449	67	516	516	-	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,031	28	74	328	-	296	451	397	2,605	2,605	-	-	-	715	-	-	-	-	-	42,875	139
Period 1b Period-Dependent Costs																						
1b.4.1	Decon supplies	647	-	-	-	-	-	-	162	809	809	-	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	359	36	395	395	-	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	4	0	4	4	-	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	261	-	-	-	-	-	65	327	327	-	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	178	-	-	-	-	-	27	205	205	-	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	10	3	-	32	-	9	54	54	-	-	-	453	-	-	-	-	-	9,070	15
1b.4.7	Plant energy budget	-	-	-	-	-	-	736	110	847	847	-	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	118	12	130	130	-	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	168	17	185	-	185	-	-	-	-	-	-	-	-	-	-
1b.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	201	30	231	-	231	-	-	-	-	-	-	-	-	-	-
1b.4.11	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-	-
1b.4.12	NEI Fees	-	-	-	-	-	-	91	9	100	100	-	-	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,219	183	1,402	1,402	-	-	-	-	-	-	-	-	-	-	22,606
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	8,026	1,204	9,230	9,230	-	-	-	-	-	-	-	-	-	-	106,720
1b.4	Subtotal Period 1b Period-Dependent Costs	647	439	10	3	-	32	10,935	1,867	13,933	13,503	430	-	-	453	-	-	-	-	-	9,070	15
1b.0	TOTAL PERIOD 1b COST	3,382	467	84	331	-	329	11,386	3,115	19,093	18,663	430	-	-	1,168	-	-	-	-	-	51,945	34,701
<b>PERIOD 1c - Preparations for SAFSTOR Dormancy</b>																						
Period 1c Direct Decommissioning Activities																						
1c.1.1	Prepare support equipment for storage	-	437	-	-	-	-	-	66	502	502	-	-	-	-	-	-	-	-	-	-	3,000
1c.1.2	Install containment pressure equal. lines	-	36	-	-	-	-	-	5	42	42	-	-	-	-	-	-	-	-	-	-	700
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	-	-	13,072
1c.1.4	Secure building accesses	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	-	-
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	32	5	36	36	-	-	-	-	-	-	-	-	-	-	250
1c.1	Subtotal Period 1c Activity Costs	-	473	-	-	-	-	765	296	1,534	1,534	-	-	-	-	-	-	-	-	-	-	16,772
Period 1c Additional Costs																						
1c.2.1	Spent fuel pool isolation	-	-	-	-	-	-	7,391	1,109	8,500	8,500	-	-	-	-	-	-	-	-	-	-	-
1c.2.2	Asbestos Remediation	-	3,336	2	224	-	1,182	-	1,163	5,908	5,908	-	-	-	12,771	-	-	-	-	-	166,023	38,278
1c.2.3	Misc Hazardous Waste	-	-	611	193	4,947	-	-	832	6,583	6,583	-	-	-	23,332	-	-	-	-	-	1,232,428	4,905
1c.2	Subtotal Period 1c Additional Costs	-	3,336	613	418	4,947	1,182	7,391	3,104	20,991	20,991	-	-	-	23,332	12,771	-	-	-	-	1,398,451	43,183
Period 1c Collateral Costs																						
1c.3.1	Process decommissioning water waste	135	-	89	392	-	354	-	224	1,193	1,193	-	-	-	854	-	-	-	-	-	51,241	167
1c.3.3	Small tool allowance	-	40	-	-	-	-	-	6	46	46	-	-	-	-	-	-	-	-	-	-	-
1c.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	27	3	29	29	-	-	-	-	-	-	-	-	-	-	-
1c.3.5	Fixed Overhead	-	-	-	-	-	-	454	68	522	522	-	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	135	40	89	392	-	354	480	300	1,790	1,790	-	-	-	854	-	-	-	-	-	51,241	167

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	361	36	397	397	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	4	0	4	4	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	381	-	-	-	-	-	95	476	476	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	180	-	-	-	-	-	27	207	207	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	3	1	-	9	-	3	15	15	-	-	-	126	-	-	-	2,511	4	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	744	112	856	856	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	120	12	132	132	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	170	17	187	-	187	-	-	-	-	-	-	-	-	-
1c.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	203	30	234	-	234	-	-	-	-	-	-	-	-	-
1c.4.10	ISFSI Operating Costs	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-
1c.4.11	NEI Fees	-	-	-	-	-	-	92	9	102	102	-	-	-	-	-	-	-	-	-	-
1c.4.12	Security Staff Cost	-	-	-	-	-	-	1,233	185	1,418	1,418	-	-	-	-	-	-	-	-	-	22,851
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	8,113	1,217	9,330	9,330	-	-	-	-	-	-	-	-	-	107,880
1c.4	Subtotal Period 1c Period-Dependent Costs	-	561	3	1	-	9	11,052	1,745	13,371	12,936	435	-	-	126	-	-	-	2,511	4	130,731
1c.0	TOTAL PERIOD 1c COST	135	4,410	704	811	4,947	1,545	19,689	5,446	37,686	37,251	435	-	23,332	13,751	-	-	-	1,452,203	60,126	130,981
<b>PERIOD 1 TOTALS</b>		<b>3,517</b>	<b>5,954</b>	<b>797</b>	<b>1,145</b>	<b>4,947</b>	<b>1,906</b>	<b>76,075</b>	<b>15,361</b>	<b>109,703</b>	<b>105,833</b>	<b>3,869</b>	<b>-</b>	<b>23,332</b>	<b>15,377</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,513,307</b>	<b>94,842</b>	<b>728,497</b>
<b>PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage</b>																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2a.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2a.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	234	35	270	270	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	560	140	700	700	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	794	175	969	969	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	59,346	8,902	68,248	-	68,248	-	-	-	-	-	-	-	-	-
2a.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-
2a.3.3	Fixed Overhead	-	-	-	-	-	-	7,121	1,068	8,189	8,189	-	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	66,468	9,970	76,438	8,190	68,248	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	2,562	256	2,818	2,591	227	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	58	6	64	64	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	584	-	-	-	-	-	146	730	730	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	14	5	-	48	-	14	81	81	-	-	-	678	-	-	-	13,550	22	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	2,336	350	2,687	1,343	1,343	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	1,109	111	1,219	1,219	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,834	183	2,017	-	2,017	-	-	-	-	-	-	-	-	-
2a.4.8	Spent Fuel Pool O&M	-	-	-	-	-	-	3,189	478	3,668	-	3,668	-	-	-	-	-	-	-	-	-
2a.4.9	ISFSI Operating Costs	-	-	-	-	-	-	196	29	225	-	225	-	-	-	-	-	-	-	-	-
2a.4.10	NEI Fees	-	-	-	-	-	-	1,449	145	1,594	-	1,594	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	19,352	2,903	22,255	3,437	18,818	-	-	-	-	-	-	-	-	358,743
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	25,135	3,770	28,906	4,263	24,643	-	-	-	-	-	-	-	-	313,608
2a.4	Subtotal Period 2a Period-Dependent Costs	-	584	14	5	-	48	57,220	8,393	66,264	13,728	52,536	-	-	678	-	-	-	13,550	22	672,351
2a.0	TOTAL PERIOD 2a COST	-	584	14	5	-	48	124,482	18,538	143,671	22,888	120,784	-	-	678	-	-	-	13,550	22	672,351
<b>PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage</b>																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2b.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2b.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	2,007	301	2,308	2,308	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	4,792	1,198	5,990	5,990	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	6,799	1,499	8,298	8,298	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	48,837	7,326	56,163	-	56,163	-	-	-	-	-	-	-	-	-
2b.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	5	0	5	5	-	-	-	-	-	-	-	-	-	-
2b.3.3	Fixed Overhead	-	-	-	-	-	-	12,194	1,829	14,023	14,023	-	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	61,036	9,155	70,192	14,029	56,163	-	-	-	-	-	-	-	-	-

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 2b Period-Dependent Costs																						
2b.4.1	Insurance	-	-	-	-	-	-	20,164	2,016	22,181	-	22,181	-	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	495	49	544	544	-	-	-	-	-	-	-	-	-	-	
2b.4.3	Health physics supplies	-	2,257	-	-	-	-	-	564	2,822	2,822	-	-	-	-	-	-	-	-	-	-	
2b.4.4	Disposal of DAW generated	-	-	53	18	-	181	-	53	305	305	-	-	-	2,538	-	-	-	-	50,754	83	
2b.4.5	Plant energy budget	-	-	-	-	-	-	10,002	1,500	11,503	11,503	-	-	-	-	-	-	-	-	-	-	
2b.4.6	NRC Fees	-	-	-	-	-	-	9,161	916	10,077	10,077	-	-	-	-	-	-	-	-	-	-	
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	15,701	1,570	17,271	-	17,271	-	-	-	-	-	-	-	-	-	
2b.4.8	ISFSI Operating Costs	-	-	-	-	-	-	1,677	251	1,928	-	1,928	-	-	-	-	-	-	-	-	-	
2b.4.9	Security Staff Cost	-	-	-	-	-	-	73,321	10,998	84,319	29,430	54,889	-	-	-	-	-	-	-	-	1,500,120	
2b.4.10	Utility Staff Cost	-	-	-	-	-	-	54,592	8,189	62,781	36,501	26,280	-	-	-	-	-	-	-	-	714,343	
2b.4	Subtotal Period 2b Period-Dependent Costs	-	2,257	53	18	-	181	185,113	26,108	213,730	91,181	122,549	-	-	2,538	-	-	-	-	50,754	83	2,214,463
2b.0	TOTAL PERIOD 2b COST	-	2,257	53	18	-	181	252,948	36,762	292,219	113,508	178,711	-	-	2,538	-	-	-	-	50,754	83	2,214,463
<b>PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage</b>																						
Period 2c Direct Decommissioning Activities																						
2c.1.1	Quarterly Inspection	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2c.1.2	Semi-annual environmental survey	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2c.1.3	Prepare reports	-	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	788	118	906	906	-	-	-	-	-	-	-	-	-	-	
2c.1.5	Maintenance supplies	-	-	-	-	-	-	1,881	470	2,351	2,351	-	-	-	-	-	-	-	-	-	-	
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	2,669	588	3,257	3,257	-	-	-	-	-	-	-	-	-	-	
Period 2c Collateral Costs																						
2c.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	2	0	2	2	-	-	-	-	-	-	-	-	-	-	
2c.3.2	Fixed Overhead	-	-	-	-	-	-	4,787	718	5,505	5,505	-	-	-	-	-	-	-	-	-	-	
2c.3	Subtotal Period 2c Collateral Costs	-	-	-	-	-	-	4,788	718	5,507	5,507	-	-	-	-	-	-	-	-	-	-	
Period 2c Period-Dependent Costs																						
2c.4.1	Insurance	-	-	-	-	-	-	7,915	792	8,707	8,707	-	-	-	-	-	-	-	-	-	-	
2c.4.2	Property taxes	-	-	-	-	-	-	194	19	214	214	-	-	-	-	-	-	-	-	-	-	
2c.4.3	Health physics supplies	-	845	-	-	-	-	-	211	1,056	1,056	-	-	-	-	-	-	-	-	-	-	
2c.4.4	Disposal of DAW generated	-	-	20	6	-	67	-	20	112	112	-	-	-	934	-	-	-	-	18,689	30	
2c.4.5	Plant energy budget	-	-	-	-	-	-	3,926	589	4,515	4,515	-	-	-	-	-	-	-	-	-	-	
2c.4.6	NRC Fees	-	-	-	-	-	-	3,473	347	3,820	3,820	-	-	-	-	-	-	-	-	-	-	
2c.4.7	Security Staff Cost	-	-	-	-	-	-	10,045	1,507	11,552	11,552	-	-	-	-	-	-	-	-	-	210,300	
2c.4.8	Utility Staff Cost	-	-	-	-	-	-	12,459	1,869	14,328	14,328	-	-	-	-	-	-	-	-	-	173,568	
2c.4	Subtotal Period 2c Period-Dependent Costs	-	845	20	6	-	67	38,013	5,354	44,304	44,304	-	-	-	934	-	-	-	-	18,689	30	383,868
2c.0	TOTAL PERIOD 2c COST	-	845	20	6	-	67	45,470	6,660	53,067	53,067	-	-	-	934	-	-	-	-	18,689	30	383,868
<b>PERIOD 2 TOTALS</b>																						
- 3,686 87 29 - 295 422,900 61,960 488,957 189,462 299,495 - 4,150 - - - 82,993 135 3,270,681																						
<b>PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy</b>																						
Period 3a Direct Decommissioning Activities																						
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	556	
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	1,969	
3a.1.3	Perform detailed rad survey	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
3a.1.4	End product description	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428	
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	71	11	81	81	-	-	-	-	-	-	-	-	-	556	
3a.1.6	Define major work sequence	-	-	-	-	-	-	408	61	469	469	-	-	-	-	-	-	-	-	-	3,210	
3a.1.7	Perform SER and EA	-	-	-	-	-	-	169	25	194	194	-	-	-	-	-	-	-	-	-	1,327	
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	2,140	
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	223	33	256	256	-	-	-	-	-	-	-	-	-	1,753	
3a.1.10	Receive NRC approval of termination plan	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-	
Activity Specifications																						
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	401	60	461	415	-	46	-	-	-	-	-	-	-	-	3,154
3a.1.11.2	Plant systems	-	-	-	-	-	-	227	34	261	235	-	26	-	-	-	-	-	-	-	-	1,783
3a.1.11.3	Reactor internals	-	-	-	-	-	-	386	58	444	444	-	-	-	-	-	-	-	-	-	-	3,039
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	353	53	406	406	-	-	-	-	-	-	-	-	-	-	2,782
3a.1.11.5	Biological shield	-	-	-	-	-	-	27	4	31	31	-	-	-	-	-	-	-	-	-	-	214
3a.1.11.6	Steam generators	-	-	-	-	-	-	170	25	195	195	-	-	-	-	-	-	-	-	-	-	1,335
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	87	13	100	50	-	50	-	-	-	-	-	-	-	-	685

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Activity Specifications (continued)																						
3a.1.11.8	Main Turbine	-	-	-	-	-	-	22	3	25	-	-	25	-	-	-	-	-	-	-	171	
3a.1.11.9	Main Condensers	-	-	-	-	-	-	22	3	25	-	-	25	-	-	-	-	-	-	-	171	
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	170	25	195	98	-	98	-	-	-	-	-	-	-	1,335	
3a.1.11.11	Waste management	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	1,969	
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	49	7	56	28	-	28	-	-	-	-	-	-	-	385	
3a.1.11	Total	-	-	-	-	-	-	2,163	324	2,487	2,190	-	298	-	-	-	-	-	-	-	17,024	
Planning & Site Preparations																						
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	131	20	150	150	-	-	-	-	-	-	-	-	-	1,027	
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	3,100	465	3,565	3,565	-	-	-	-	-	-	-	-	-	-	
3a.1.14	Design water clean-up system	-	-	-	-	-	-	76	11	88	88	-	-	-	-	-	-	-	-	-	599	
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,300	345	2,645	2,645	-	-	-	-	-	-	-	-	-	-	
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	67	10	77	77	-	-	-	-	-	-	-	-	-	526	
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	9,353	1,403	10,756	10,459	-	298	-	-	-	-	-	-	-	31,117	
Period 3a Additional Costs																						
3a.2.1	Site Characterization	-	-	-	-	-	-	2,503	751	3,254	3,254	-	-	-	-	-	-	-	-	13,042	4,640	
3a.2	Subtotal Period 3a Additional Costs	-	-	-	-	-	-	2,503	751	3,254	3,254	-	-	-	-	-	-	-	-	13,042	4,640	
Period 3a Collateral Costs																						
3a.3.1	Florida LLRW Inspection Fee	-	-	-	-	-	-	1	0	1	1	-	-	-	-	-	-	-	-	-	-	
3a.3.2	Fixed Overhead	-	-	-	-	-	-	1,780	267	2,047	2,047	-	-	-	-	-	-	-	-	-	-	
3a.3	Subtotal Period 3a Collateral Costs	-	-	-	-	-	-	1,781	267	2,048	2,048	-	-	-	-	-	-	-	-	-	-	
Period 3a Period-Dependent Costs																						
3a.4.1	Insurance	-	-	-	-	-	-	589	59	648	648	-	-	-	-	-	-	-	-	-	-	
3a.4.2	Property taxes	-	-	-	-	-	-	14	1	16	16	-	-	-	-	-	-	-	-	-	-	
3a.4.3	Health physics supplies	-	309	-	-	-	-	-	77	386	386	-	-	-	-	-	-	-	-	-	-	
3a.4.4	Heavy equipment rental	-	706	-	-	-	-	-	106	812	812	-	-	-	-	-	-	-	-	-	-	
3a.4.5	Disposal of DAW generated	-	-	8	3	-	26	-	8	44	44	-	-	364	-	-	-	-	-	7,277	12	
3a.4.6	Plant energy budget	-	-	-	-	-	-	2,920	438	3,358	3,358	-	-	-	-	-	-	-	-	-	-	
3a.4.7	NRC Fees	-	-	-	-	-	-	341	34	375	375	-	-	-	-	-	-	-	-	-	-	
3a.4.8	NEI Fees	-	-	-	-	-	-	362	36	399	399	-	-	-	-	-	-	-	-	-	-	
3a.4.9	Security Staff Cost	-	-	-	-	-	-	1,441	216	1,657	1,657	-	-	-	-	-	-	-	-	-	37,814	
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	14,746	2,212	16,958	16,958	-	-	-	-	-	-	-	-	-	200,229	
3a.4	Subtotal Period 3a Period-Dependent Costs	-	1,014	8	3	-	26	20,414	3,187	24,652	24,652	-	-	364	-	-	-	-	-	7,277	12	238,043
3a.0	TOTAL PERIOD 3a COST	-	1,014	8	3	-	26	34,051	5,608	40,710	40,412	-	298	-	364	-	-	-	-	7,277	13,054	273,799
<b>PERIOD 3b - Decommissioning Preparations</b>																						
Period 3b Direct Decommissioning Activities																						
Detailed Work Procedures																						
3b.1.1.1	Plant systems	-	-	-	-	-	-	257	39	296	266	-	30	-	-	-	-	-	-	-	2,026	
3b.1.1.2	Reactor internals	-	-	-	-	-	-	136	20	156	156	-	-	-	-	-	-	-	-	-	1,070	
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	73	11	84	21	-	63	-	-	-	-	-	-	-	578	
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428	
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428	
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	54	8	63	63	-	-	-	-	-	-	-	-	-	428	
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	197	30	227	227	-	-	-	-	-	-	-	-	-	1,554	
3b.1.1.8	Facility closeout	-	-	-	-	-	-	65	10	75	38	-	38	-	-	-	-	-	-	-	514	
3b.1.1.9	Missile shields	-	-	-	-	-	-	24	4	28	28	-	-	-	-	-	-	-	-	-	193	
3b.1.1.10	Biological shield	-	-	-	-	-	-	65	10	75	75	-	-	-	-	-	-	-	-	-	514	
3b.1.1.11	Steam generators	-	-	-	-	-	-	250	38	288	288	-	-	-	-	-	-	-	-	-	1,969	
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	54	8	63	31	-	31	-	-	-	-	-	-	-	428	
3b.1.1.13	Main Turbine	-	-	-	-	-	-	85	13	98	-	-	98	-	-	-	-	-	-	-	668	
3b.1.1.14	Main Condensers	-	-	-	-	-	-	85	13	98	-	-	98	-	-	-	-	-	-	-	668	
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	148	22	171	154	-	17	-	-	-	-	-	-	-	1,168	
3b.1.1.16	Reactor building	-	-	-	-	-	-	148	22	171	154	-	17	-	-	-	-	-	-	-	1,168	
3b.1.1	Total	-	-	-	-	-	-	1,753	263	2,016	1,625	-	391	-	-	-	-	-	-	-	13,800	
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	1,753	263	2,016	1,625	-	391	-	-	-	-	-	-	-	13,800	
Period 3b Collateral Costs																						
3b.3.1	Decon equipment	918	-	-	-	-	-	-	138	1,056	1,056	-	-	-	-	-	-	-	-	-	-	
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,549	232	1,781	1,781	-	-	-	-	-	-	-	-	-	-	
3b.3.3	Pipe cutting equipment	-	1,200	-	-	-	-	-	180	1,380	1,380	-	-	-	-	-	-	-	-	-	-	

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3b Collateral Costs (continued)																					
3b.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-
3b.3.5	Fixed Overhead	-	-	-	-	-	-	902	135	1,038	1,038	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	918	1,200	-	-	-	-	2,451	685	5,255	5,255	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	28	-	-	-	-	-	-	7	36	36	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	298	30	328	328	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	7	1	8	8	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	173	-	-	-	-	-	43	216	216	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	358	-	-	-	-	-	54	411	411	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	4	1	-	15	-	4	25	25	-	-	209	-	-	-	-	4,189	7	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	1,480	222	1,702	1,702	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	173	17	190	190	-	-	-	-	-	-	-	-	-	-
3b.4.9	NEI Fees	-	-	-	-	-	-	184	18	202	202	-	-	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	730	110	840	840	-	-	-	-	-	-	-	-	-	19,166
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	3,515	527	4,042	4,042	-	-	-	-	-	-	-	-	-	43,343
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	7,474	1,121	8,595	8,595	-	-	-	-	-	-	-	-	-	101,486
3b.4	Subtotal Period 3b Period-Dependent Costs	28	531	4	1	-	15	13,862	2,155	16,596	16,596	-	-	-	209	-	-	-	4,189	7	163,995
3b.0	TOTAL PERIOD 3b COST	946	1,731	4	1	-	15	18,066	3,103	23,867	23,476	-	391	-	209	-	-	-	4,189	7	177,795
<b>PERIOD 3 TOTALS</b>		946	2,745	12	4	-	41	52,117	8,711	64,577	63,889	-	689	-	573	-	-	-	11,465	13,061	451,594
<b>PERIOD 4a - Large Component Removal</b>																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	11	40	8	11	39	87	-	45	241	241	-	-	201	213	-	-	-	46,608	1,055	-
4a.1.1.2	Pressurizer Relief Tank	5	18	6	7	25	52	-	25	139	139	-	-	133	133	-	-	-	29,424	480	-
4a.1.1.3	Reactor Coolant Pumps & Motors	10	61	45	143	-	784	-	242	1,285	1,285	-	-	-	2,396	-	-	-	555,300	1,932	80
4a.1.1.4	Pressurizer	7	52	360	99	-	963	-	308	1,790	1,790	-	-	-	2,944	-	-	-	207,852	1,496	750
4a.1.1.5	Steam Generators	47	3,461	1,337	4,232	1,408	4,083	-	2,889	17,458	17,458	-	-	26,258	12,483	-	-	-	2,143,159	9,661	1,125
4a.1.1.6	Retired Steam Generator Units	-	-	645	3,937	-	4,083	-	1,676	10,341	10,341	-	-	-	12,483	-	-	-	1,364,708	2,380	1,125
4a.1.1.7	CRDMs/CIs/Service Structure Removal	27	195	198	68	48	345	-	186	1,067	1,067	-	-	753	2,540	-	-	-	124,734	4,544	-
4a.1.1.8	Reactor Vessel Internals	65	2,528	7,877	1,563	-	7,880	240	8,265	28,418	28,418	-	-	-	632	501	842	-	222,881	20,450	950
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	13,033	-	1,955	14,987	14,987	-	-	-	-	-	-	2,061	407,628	-	-
4a.1.1.10	Reactor Vessel	-	4,614	1,454	521	-	2,525	240	14,607	14,607	14,607	-	-	-	7,720	-	-	-	787,443	20,450	950
4a.1.1	Totals	172	10,968	11,931	10,582	1,520	33,835	480	20,844	90,333	90,333	-	-	27,344	41,544	501	842	2,061	5,889,738	62,447	4,980
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	259	101	34	375	-	-	136	905	905	-	-	4,815	-	-	-	-	216,662	5,387	-
4a.1.3	Main Condensers	-	869	116	39	431	-	-	299	1,754	1,754	-	-	5,535	-	-	-	-	249,061	18,250	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Containment	-	734	-	-	-	-	-	110	844	844	-	-	-	-	-	-	-	-	-	8,126
4a.1.4.2	Auxiliary	-	122	-	-	-	-	-	18	140	140	-	-	-	-	-	-	-	-	-	1,630
4a.1.4.3	Radwaste Solidification	-	89	-	-	-	-	-	13	102	102	-	-	-	-	-	-	-	-	-	1,099
4a.1.4.4	Fuel Handling	-	56	-	-	-	-	-	8	64	64	-	-	-	-	-	-	-	-	-	663
4a.1.4	Totals	-	1,000	-	-	-	-	-	150	1,150	1,150	-	-	-	-	-	-	-	-	-	11,518
Disposal of Plant Systems																					
4a.1.5.1	Amertap	-	83	-	-	-	-	-	12	95	-	-	95	-	-	-	-	-	-	-	1,847
4a.1.5.2	Auxiliary Feedwater	-	16	-	-	-	-	-	2	18	-	-	18	-	-	-	-	-	-	-	352
4a.1.5.3	Auxiliary Feedwater - Insulated	-	28	-	-	-	-	-	4	32	-	-	32	-	-	-	-	-	-	-	623
4a.1.5.4	Auxiliary Feedwater - Insulated - RCA	-	179	2	7	77	-	-	58	323	323	-	-	1,095	-	-	-	-	44,472	3,516	-
4a.1.5.5	Auxiliary Feedwater - RCA	-	38	0	2	17	-	-	12	69	69	-	-	244	-	-	-	-	9,925	728	-
4a.1.5.6	Auxiliary Steam	-	1	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	-	34
4a.1.5.7	Auxiliary Steam - Insulated	-	44	-	-	-	-	-	7	51	-	-	51	-	-	-	-	-	-	-	1,031
4a.1.5.8	Auxiliary Steam - Insulated - RCA	-	9	0	1	6	-	-	3	19	19	-	-	79	-	-	-	-	3,221	180	-
4a.1.5.9	Auxiliary Steam - RCA	-	0	0	0	0	-	-	0	0	0	-	-	1	-	-	-	-	59	5	-
4a.1.5.10	Breathing Air - Insulated - RCA	-	5	0	0	2	-	-	2	8	8	-	-	24	-	-	-	-	961	98	-
4a.1.5.11	Breathing Air - RCA	-	72	1	5	52	-	-	27	156	156	-	-	738	-	-	-	-	29,977	1,425	-
4a.1.5.12	Chemical & Volume Control	-	443	45	88	421	383	-	287	1,668	1,668	-	-	5,999	1,680	-	-	-	351,291	9,242	-
4a.1.5.13	Chemical & Volume Control - Insulated	-	452	27	40	39	279	-	197	1,033	1,033	-	-	550	1,182	-	-	-	100,568	8,887	-
4a.1.5.14	Circulating Water	-	116	-	-	-	-	-	17	134	-	-	134	-	-	-	-	-	-	-	2,697
4a.1.5.15	Component Cooling Water	-	205	-	-	-	-	-	31	236	-	-	236	-	-	-	-	-	-	-	4,791

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Disposal of Plant Systems (continued)																					
4a.1.5.16	Component Cooling Water - RCA	-	483	13	52	578	-	-	217	1,343	1,343	-	-	8,229	-	-	-	-	334,203	9,421	-
4a.1.5.17	Condensate	-	206	-	-	-	-	-	31	237	-	-	237	-	-	-	-	-	-	4,701	-
4a.1.5.18	Condensate - Insulated	-	80	-	-	-	-	-	12	92	-	-	92	-	-	-	-	-	-	1,892	-
4a.1.5.19	Condensate Polishing	-	35	-	-	-	-	-	5	40	-	-	40	-	-	-	-	-	-	784	-
4a.1.5.20	Condensate Polishing - Ins	-	106	-	-	-	-	-	16	122	-	-	122	-	-	-	-	-	-	2,448	-
4a.1.5.21	Condensate Recovery	-	25	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	554	-
4a.1.5.22	Condensate Recovery - Insulated	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	99	-
4a.1.5.23	Condensate Recovery - Insulated - RCA	-	9	0	0	3	-	-	3	15	15	-	-	43	-	-	-	-	1,728	167	-
4a.1.5.24	Condensate Recovery - RCA	-	30	0	1	12	-	-	9	53	53	-	-	166	-	-	-	-	6,731	572	-
4a.1.5.25	Condensate Storage	-	75	-	-	-	-	-	11	86	-	-	86	-	-	-	-	-	-	1,651	-
4a.1.5.26	Condenser	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	636	-
4a.1.5.27	Containment Post Accident Eval	-	14	0	0	5	-	-	4	24	24	-	-	78	-	-	-	-	3,171	284	-
4a.1.5.28	Containment Post Accident Eval - Ins	-	23	0	1	8	-	-	7	39	39	-	-	121	-	-	-	-	4,898	422	-
4a.1.5.29	Containment Purge	-	45	2	6	68	-	-	23	143	143	-	-	972	-	-	-	-	39,455	864	-
4a.1.5.30	Electrical - Clean	-	2,143	-	-	-	-	-	321	2,464	-	-	2,464	-	-	-	-	-	-	47,559	-
4a.1.5.31	Extraction Steam	-	13	-	-	-	-	-	2	15	-	-	15	-	-	-	-	-	-	317	-
4a.1.5.32	Extraction Steam - Insulated	-	80	-	-	-	-	-	12	92	-	-	92	-	-	-	-	-	-	1,908	-
4a.1.5.33	Feedwater	-	143	-	-	-	-	-	21	165	-	-	165	-	-	-	-	-	-	3,134	-
4a.1.5.34	Feedwater - Insulated	-	240	-	-	-	-	-	36	276	-	-	276	-	-	-	-	-	-	5,619	-
4a.1.5.35	Feedwater - Insulated - RCA	-	105	2	9	101	-	-	43	261	261	-	-	1,437	-	-	-	-	58,357	2,084	-
4a.1.5.36	Feedwater - RCA	-	10	0	1	10	-	-	4	25	25	-	-	143	-	-	-	-	5,790	197	-
4a.1.5.37	Feedwater Heater Drains & Vents	-	52	-	-	-	-	-	8	60	-	-	60	-	-	-	-	-	-	1,202	-
4a.1.5.38	Feedwater Heater Drains & Vents - Ins	-	386	-	-	-	-	-	58	444	-	-	444	-	-	-	-	-	-	9,047	-
4a.1.5.39	Generator	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	126	-
4a.1.5.40	Generator - Insulated	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	47	-
4a.1.5.41	HVAC - Clean	-	165	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	4,217	-
4a.1.5.42	Instrument Air	-	22	-	-	-	-	-	3	25	-	-	25	-	-	-	-	-	-	501	-
4a.1.5.43	Instrument Air - Insulated	-	19	-	-	-	-	-	3	21	-	-	21	-	-	-	-	-	-	445	-
4a.1.5.44	Intake Cooling Water	-	211	-	-	-	-	-	32	243	-	-	243	-	-	-	-	-	-	4,964	-
4a.1.5.45	Main Steam - Insulated	-	204	-	-	-	-	-	31	235	-	-	235	-	-	-	-	-	-	4,732	-
4a.1.5.46	Main Steam - Insulated - RCA	-	57	1	6	66	-	-	25	155	155	-	-	934	-	-	-	-	37,923	1,134	-
4a.1.5.47	Nitrogen & Hydrogen	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	27	-
4a.1.5.48	Nitrogen & Hydrogen - RCA	-	1	0	0	1	-	-	0	3	3	-	-	10	-	-	-	-	396	25	-
4a.1.5.49	Safety Injection	-	197	6	24	271	-	-	94	593	593	-	-	3,857	-	-	-	-	156,645	4,107	-
4a.1.5.50	Safety Injection - Insulated	-	148	3	10	113	-	-	56	329	329	-	-	1,610	-	-	-	-	65,368	2,877	-
4a.1.5.51	Sample - NSSS	-	46	0	1	11	-	-	13	71	71	-	-	153	-	-	-	-	6,224	1,027	-
4a.1.5.52	Sample - NSSS - Ins	-	57	0	1	7	-	-	15	80	80	-	-	93	-	-	-	-	3,762	1,303	-
4a.1.5.53	Screen Wash	-	34	-	-	-	-	-	5	39	-	-	39	-	-	-	-	-	-	757	-
4a.1.5.54	Secondary Sample	-	4	-	-	-	-	-	1	4	-	-	4	-	-	-	-	-	-	87	-
4a.1.5.55	Secondary Sample - RCA	-	4	0	0	1	-	-	1	7	7	-	-	19	-	-	-	-	760	85	-
4a.1.5.56	Secondary Wet Layup	-	24	-	-	-	-	-	4	27	-	-	27	-	-	-	-	-	-	543	-
4a.1.5.57	Secondary Wet Layup - RCA	-	20	0	1	11	-	-	7	39	39	-	-	155	-	-	-	-	6,280	375	-
4a.1.5.58	Turbine Building HVAC	-	19	-	-	-	-	-	3	22	-	-	22	-	-	-	-	-	-	451	-
4a.1.5.59	Turbine Lube Oil	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	1,197	-
4a.1.5.60	Turbine Plant Chemical Addition	-	5	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	112	-
4a.1.5.61	Turbine Plant Cooling Water	-	105	-	-	-	-	-	16	121	-	-	121	-	-	-	-	-	-	2,416	-
4a.1.5.62	Turbine Plant Cooling Water - Insulated	-	62	-	-	-	-	-	9	71	-	-	71	-	-	-	-	-	-	1,440	-
4a.1.5.63	Turbine Steam	-	92	-	-	-	-	-	14	106	-	-	106	-	-	-	-	-	-	2,165	-
4a.1.5.64	Turbine Steam - Insulated	-	43	-	-	-	-	-	6	49	-	-	49	-	-	-	-	-	-	1,009	-
4a.1.5	Totals	-	7,624	104	256	1,879	662	-	1,884	12,410	6,456	-	5,954	26,748	2,863	-	-	-	1,272,165	167,184	-
4a.1.6	Scaffolding in support of decommissioning	-	388	9	4	32	8	-	105	546	546	-	-	407	36	-	-	-	20,679	9,387	-
4a.1	Subtotal Period 4a Activity Costs	172	21,107	12,262	10,915	4,236	34,506	480	23,420	107,098	101,144	-	5,954	64,849	44,443	501	842	2,061	7,648,305	274,173	4,980
Period 4a Additional Costs																					
4a.2.1	Remedial Action Surveys	-	-	-	-	-	-	1,334	400	1,735	1,735	-	-	-	-	-	-	-	-	25,285	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	-	-	-	1,334	400	1,735	1,735	-	-	-	-	-	-	-	-	25,285	-
Period 4a Collateral Costs																					
4a.3.1	Process decommissioning water waste	3	-	6	25	-	23	-	12	69	69	-	-	-	55	-	-	-	3,315	11	-
4a.3.3	Small tool allowance	-	238	-	-	-	-	-	36	274	246	-	27	-	-	-	-	-	-	-	-
4a.3.4	Florida LLRW Inspection Fee	-	-	-	-	-	-	100	10	110	110	-	-	-	-	-	-	-	-	-	-
4a.3.5	Fixed Overhead	-	-	-	-	-	-	2,166	325	2,490	2,490	-	-	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	3	238	6	25	-	23	2,265	382	2,943	2,915	-	27	-	55	-	-	-	3,315	11	-

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 4a Period-Dependent Costs																						
4a.4.1	Decon supplies	68	-	-	-	-	-	-	17	85	85	-	-	-	-	-	-	-	-	-	-	
4a.4.2	Insurance	-	-	-	-	-	-	716	72	788	788	-	-	-	-	-	-	-	-	-	-	
4a.4.3	Property taxes	-	-	-	-	-	-	18	2	19	17	-	2	-	-	-	-	-	-	-	-	
4a.4.4	Health physics supplies	-	1,868	-	-	-	-	-	467	2,335	2,335	-	-	-	-	-	-	-	-	-	-	
4a.4.5	Heavy equipment rental	-	3,096	-	-	-	-	-	464	3,560	3,560	-	-	-	-	-	-	-	-	-	-	
4a.4.6	Disposal of DAW generated	-	-	67	22	-	226	-	66	380	380	-	-	-	3,168	-	-	-	-	63,357	103	
4a.4.7	Plant energy budget	-	-	-	-	-	-	3,375	506	3,881	3,881	-	-	-	-	-	-	-	-	-	-	
4a.4.8	NRC Fees	-	-	-	-	-	-	516	52	567	567	-	-	-	-	-	-	-	-	-	-	
4a.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	491	74	565	565	-	-	-	-	-	-	-	-	-	-	
4a.4.10	NEI Fees	-	-	-	-	-	-	441	44	485	485	-	-	-	-	-	-	-	-	-	-	
4a.4.11	Security Staff Cost	-	-	-	-	-	-	1,981	297	2,278	2,278	-	-	-	-	-	-	-	-	-	53,280	
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	14,779	2,217	16,995	16,995	-	-	-	-	-	-	-	-	-	175,063	
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	24,464	3,670	28,134	28,134	-	-	-	-	-	-	-	-	-	317,143	
4a.4	Subtotal Period 4a Period-Dependent Costs	68	4,963	67	22	-	226	46,780	7,947	60,072	60,070	-	2	-	3,168	-	-	-	-	63,357	103	
4a.0	TOTAL PERIOD 4a COST	243	26,309	12,335	10,962	4,236	34,754	50,859	32,149	171,847	165,864	-	5,983	64,849	47,666	501	842	2,061	7,714,976	299,573	550,466	
<b>PERIOD 4b - Site Decontamination</b>																						
Period 4b Direct Decommissioning Activities																						
4b.1.1	Remove spent fuel racks	384	42	161	115	-	874	-	454	2,029	2,029	-	-	-	3,714	-	-	-	-	245,474	1,023	-
Disposal of Plant Systems																						
4b.1.2.1	Auxiliary Bldg HVAC	-	233	6	22	245	-	-	99	605	605	-	-	3,485	-	-	-	-	-	141,520	4,170	-
4b.1.2.2	Containment Emergency Filter	-	5	0	0	3	-	-	2	10	10	-	-	47	-	-	-	-	-	1,929	99	-
4b.1.2.3	Containment Normal & Emerg Cooling	-	544	12	47	526	-	-	223	1,353	1,353	-	-	7,494	-	-	-	-	-	304,319	9,404	-
4b.1.2.4	Containment Normal & Emerg Cooling - Ins	-	6	0	0	3	-	-	2	10	10	-	-	37	-	-	-	-	-	1,521	95	-
4b.1.2.5	Containment Spray	-	73	1	5	58	-	-	28	165	165	-	-	827	-	-	-	-	-	33,587	1,390	-
4b.1.2.6	Containment Spray - Insulated	-	58	1	3	33	-	-	20	115	115	-	-	467	-	-	-	-	-	18,968	1,089	-
4b.1.2.7	Control Building HVAC	-	27	-	-	-	-	-	4	31	-	-	31	-	-	-	-	-	-	-	636	-
4b.1.2.8	EDG Building HVAC	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	-	79	-
4b.1.2.9	Electrical - Contaminated	-	317	4	15	168	-	-	107	610	610	-	-	2,386	-	-	-	-	-	96,905	6,013	-
4b.1.2.10	Electrical - Decontaminated	-	2,835	34	135	1,492	-	-	956	5,452	5,452	-	-	21,242	-	-	-	-	-	862,654	53,766	-
4b.1.2.11	Emergency Diesel Engine & Oil	-	75	-	-	-	-	-	11	86	-	-	86	-	-	-	-	-	-	-	1,676	-
4b.1.2.12	Emergency Diesel Engine & Oil - Ins	-	3	-	-	-	-	-	0	4	-	-	4	-	-	-	-	-	-	-	77	-
4b.1.2.13	Fire Protection	-	349	-	-	-	-	-	52	402	-	-	402	-	-	-	-	-	-	-	7,798	-
4b.1.2.14	Fire Protection - RCA	-	975	19	77	850	-	-	385	2,306	2,306	-	-	12,105	-	-	-	-	-	491,604	18,818	-
4b.1.2.15	Fuel Handling HVAC	-	51	1	4	49	-	-	21	126	126	-	-	697	-	-	-	-	-	28,296	908	-
4b.1.2.16	HVAC - Contaminated	-	49	1	4	46	-	-	20	120	120	-	-	659	-	-	-	-	-	26,782	832	-
4b.1.2.17	Instrument Air - Insulated - RCA	-	109	1	3	31	-	-	32	176	176	-	-	439	-	-	-	-	-	17,845	2,215	-
4b.1.2.18	Instrument Air - RCA	-	67	0	2	20	-	-	20	110	110	-	-	288	-	-	-	-	-	11,715	1,356	-
4b.1.2.19	Miscellaneous - RCA	-	6	0	1	14	-	-	4	26	26	-	-	206	-	-	-	-	-	8,368	128	-
4b.1.2.20	Primary Water Makeup	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	-	1,668	-
4b.1.2.21	Radwaste Building HVAC	-	109	2	9	100	-	-	44	264	264	-	-	1,428	-	-	-	-	-	58,000	1,892	-
4b.1.2.22	Reactor Coolant - Insulated	-	78	4	7	8	46	-	34	178	178	-	-	112	197	-	-	-	-	17,592	1,553	-
4b.1.2.23	Refueling Equipment	-	154	10	20	96	89	-	79	449	449	-	-	1,362	379	-	-	-	-	80,363	3,225	-
4b.1.2.24	Residual Heat Removal	-	79	64	95	174	603	-	217	1,232	1,232	-	-	2,476	2,558	-	-	-	-	269,855	1,747	-
4b.1.2.25	Residual Heat Removal - Insulated	-	294	37	59	138	358	-	196	1,082	1,082	-	-	1,961	1,520	-	-	-	-	180,172	5,916	-
4b.1.2.26	Safety Injection Accumulator	-	241	6	25	275	-	-	106	652	652	-	-	3,914	-	-	-	-	-	158,930	4,751	-
4b.1.2.27	Service Water	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	-	487	-
4b.1.2.28	Service Water - Insulated	-	8	-	-	-	-	-	1	10	-	-	10	-	-	-	-	-	-	-	204	-
4b.1.2.29	Service Water - Insulated - RCA	-	70	1	3	30	-	-	22	125	125	-	-	422	-	-	-	-	-	17,124	1,277	-
4b.1.2.30	Service Water - RCA	-	155	2	6	68	-	-	50	280	280	-	-	965	-	-	-	-	-	39,195	2,789	-
4b.1.2.31	Spent Fuel Pool Cooling	-	106	13	19	31	126	-	67	363	363	-	-	448	535	-	-	-	-	53,529	2,095	-
4b.1.2.32	Spent Fuel Pool Cooling - Insulated	-	54	6	8	12	53	-	30	162	162	-	-	164	224	-	-	-	-	21,488	1,051	-
4b.1.2.33	Steam Generator Wet Layup	-	1	-	-	-	-	-	0	1	-	-	1	-	-	-	-	-	-	-	25	-
4b.1.2.34	Steam Generator Wet Layup - RCA	-	1	0	0	1	-	-	0	3	3	-	-	10	-	-	-	-	-	396	25	-
4b.1.2.35	Waste Disposal	-	372	35	62	243	306	-	219	1,237	1,237	-	-	3,456	1,326	-	-	-	-	226,321	7,505	-
4b.1.2.36	Waste Disposal - Insulated	-	460	40	51	41	360	-	223	1,174	1,174	-	-	581	1,526	-	-	-	-	124,684	8,739	-
4b.1.2.37	Water Treatment Plant	-	137	-	-	-	-	-	21	158	-	-	158	-	-	-	-	-	-	-	3,065	-
4b.1.2.38	Water Treatment Plant - Insulated	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	-	2,338	-
4b.1.2	Totals	-	8,304	301	684	4,755	1,941	-	3,327	19,311	18,387	-	924	67,678	8,264	-	-	-	-	3,293,662	160,901	-
4b.1.3	Scaffolding in support of decommissioning	-	581	14	6	48	13	-	158	820	820	-	-	610	54	-	-	-	-	31,019	14,080	-

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Decontamination of Site Buildings																					
4b.1.4.1	Containment	777	985	49	638	168	1,225	-	1,066	4,907	4,907	-	-	2,384	15,152	-	-	-	1,301,378	32,738	-
4b.1.4.2	Auxiliary	371	169	8	92	82	122	-	285	1,127	1,127	-	-	1,163	1,889	-	-	-	209,701	10,408	-
4b.1.4.3	LLW Storage Area Soil Disposal	-	95	214	3,699	-	4,933	-	1,833	10,775	10,775	-	-	-	81,327	-	-	-	7,047,000	1,409	-
4b.1.4.4	LLW Storage Bldg B&C Waste	13	5	0	2	-	3	-	9	32	32	-	-	-	50	-	-	-	4,320	343	-
4b.1.4.5	Radwaste Solidification	115	61	2	30	13	40	-	90	351	351	-	-	181	639	-	-	-	62,586	3,408	-
4b.1.4.6	Fuel Handling	300	353	4	20	92	27	-	262	1,058	1,058	-	-	1,306	298	-	-	-	77,447	13,019	-
4b.1.4	Totals	1,575	1,668	277	4,480	354	6,349	-	3,545	18,249	18,249	-	-	5,034	99,355	-	-	-	8,702,431	61,326	-
4b.1	Subtotal Period 4b Activity Costs	1,959	10,595	753	5,285	5,156	9,176	-	7,484	40,408	39,485	-	924	73,323	111,387	-	-	-	12,272,590	237,329	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	1,098	330	1,428	1,428	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	Remedial Action Surveys	-	-	-	-	-	-	2,894	868	3,762	3,762	-	-	-	-	-	-	-	-	54,842	-
4b.2.3	Seaweed Remediation & Disposal	-	45	1	374	-	415	-	171	1,008	1,008	-	-	-	29,650	-	-	-	593,000	494	-
4b.2.4	Decommissioning of ISFSI	-	317	2	492	-	726	1,533	768	3,838	3,838	-	-	-	10,693	-	-	-	1,561,386	10,512	4,626
4b.2.5	Underground Services Excavation	-	351	-	-	-	942	468	123	942	-	-	942	-	-	-	-	-	-	8,000	-
4b.2.6	Operational Equipment	-	-	18	62	506	-	-	87	674	674	-	-	11,710	-	-	-	-	292,750	32	-
4b.2	Subtotal Period 4b Additional Costs	-	714	22	928	506	1,141	5,993	2,347	11,651	10,709	-	942	11,710	40,343	-	-	-	2,447,136	73,879	10,866
Period 4b Collateral Costs																					
4b.3.1	Process decommissioning water waste	8	-	14	62	-	56	-	29	168	168	-	-	-	135	-	-	-	8,083	26	-
4b.3.3	Small tool allowance	-	194	-	-	-	-	-	29	223	223	-	-	-	-	-	-	-	-	-	-
4b.3.4	Decommissioning Equipment Disposition	-	-	138	68	467	124	-	125	923	923	-	-	6,000	529	-	-	-	304,968	88	-
4b.3.5	Florida LLRW Inspection Fee	-	-	-	-	-	-	306	31	336	336	-	-	-	-	-	-	-	-	-	-
4b.3.6	Fixed Overhead	-	-	-	-	-	-	4,697	705	5,401	5,401	-	-	-	-	-	-	-	-	-	-
4b.3	Subtotal Period 4b Collateral Costs	8	194	152	130	467	180	5,003	918	7,052	7,052	-	-	6,000	664	-	-	-	313,051	114	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	781	-	-	-	-	-	-	195	977	977	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	1,593	159	1,752	1,752	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	38	4	42	42	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	2,455	-	-	-	-	-	614	3,068	3,068	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	6,894	-	-	-	-	-	1,034	7,928	7,928	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	92	30	-	312	-	92	526	526	-	-	-	4,378	-	-	-	87,554	143	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	5,779	867	6,646	6,646	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,119	112	1,231	1,231	-	-	-	-	-	-	-	-	-	-
4b.4.9	Liquid Radwaste Processing Equipment/Services	-	-	-	-	-	-	1,065	160	1,224	1,224	-	-	-	-	-	-	-	-	-	-
4b.4.10	NEI Fees	-	-	-	-	-	-	956	96	1,052	1,052	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	4,297	645	4,941	4,941	-	-	-	-	-	-	-	-	-	115,560
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	31,350	4,702	36,052	36,052	-	-	-	-	-	-	-	-	-	368,691
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	50,349	7,552	57,902	57,902	-	-	-	-	-	-	-	-	-	649,337
4b.4	Subtotal Period 4b Period-Dependent Costs	781	9,349	92	30	-	312	96,545	16,231	123,340	123,340	-	-	-	4,378	-	-	-	87,554	143	1,133,589
4b.0	TOTAL PERIOD 4b COST	2,749	20,852	1,020	6,373	6,130	10,809	107,541	26,980	182,452	180,586	-	1,865	91,033	156,771	-	-	-	15,120,330	311,466	1,144,455
<b>PERIOD 4f - License Termination</b>																					
Period 4f Direct Decommissioning Activities																					
4f.1.1	ORISE confirmatory survey	-	-	-	-	-	-	162	49	210	210	-	-	-	-	-	-	-	-	-	-
4f.1.2	Terminate license	-	-	-	-	-	-	-	-	a	-	-	-	-	-	-	-	-	-	-	-
4f.1	Subtotal Period 4f Activity Costs	-	-	-	-	-	-	162	49	210	210	-	-	-	-	-	-	-	-	-	-
Period 4f Additional Costs																					
4f.2.1	License Termination Survey	-	-	-	-	-	-	3,494	1,048	4,543	4,543	-	-	-	-	-	-	-	-	59,744	3,120
4f.2	Subtotal Period 4f Additional Costs	-	-	-	-	-	-	3,494	1,048	4,543	4,543	-	-	-	-	-	-	-	-	59,744	3,120
Period 4f Collateral Costs																					
4f.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,549	232	1,781	1,781	-	-	-	-	-	-	-	-	-	-
4f.3.2	Florida LLRW Inspection Fee	-	-	-	-	-	-	0	0	1	1	-	-	-	-	-	-	-	-	-	-
4f.3.3	Fixed Overhead	-	-	-	-	-	-	1,341	201	1,542	1,542	-	-	-	-	-	-	-	-	-	-
4f.3	Subtotal Period 4f Collateral Costs	-	-	-	-	-	-	2,890	434	3,324	3,324	-	-	-	-	-	-	-	-	-	-
Period 4f Period-Dependent Costs																					
4f.4.2	Property taxes	-	-	-	-	-	-	11	1	12	12	-	-	-	-	-	-	-	-	-	-
4f.4.3	Health physics supplies	-	384	-	-	-	-	-	96	480	480	-	-	-	-	-	-	-	-	-	-
4f.4.4	Disposal of DAW generated	-	-	5	2	-	18	-	5	30	30	-	-	-	247	-	-	-	4,938	8	-
4f.4.5	Plant energy budget	-	-	-	-	-	-	440	66	506	506	-	-	-	-	-	-	-	-	-	-

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours	
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet				
Period 4f Period-Dependent Costs (continued)																						
4f.4.6	NRC Fees	-	-	-	-	-	-	307	31	338	338	-	-	-	-	-	-	-	-	-	-	
4f.4.7	NEI Fees	-	-	-	-	-	-	273	27	300	300	-	-	-	-	-	-	-	-	-	-	
4f.4.8	Security Staff Cost	-	-	-	-	-	-	500	75	575	575	-	-	-	-	-	-	-	-	-	11,786	
4f.4.9	DOC Staff Cost	-	-	-	-	-	-	3,882	582	4,464	4,464	-	-	-	-	-	-	-	-	-	46,750	
4f.4.10	Utility Staff Cost	-	-	-	-	-	-	4,810	722	5,532	5,532	-	-	-	-	-	-	-	-	-	56,964	
4f.4	Subtotal Period 4f Period-Dependent Costs	-	384	5	2	-	18	10,223	1,605	12,238	12,238	-	-	-	247	-	-	-	-	4,938	8	115,500
4f.0	TOTAL PERIOD 4f COST	-	384	5	2	-	18	16,770	3,136	20,315	20,315	-	-	-	247	-	-	-	-	4,938	59,752	118,620
<b>PERIOD 4 TOTALS</b>		<b>2,992</b>	<b>47,545</b>	<b>13,359</b>	<b>17,336</b>	<b>10,366</b>	<b>45,581</b>	<b>175,170</b>	<b>62,264</b>	<b>374,614</b>	<b>366,765</b>	<b>-</b>	<b>7,848</b>	<b>155,881</b>	<b>204,684</b>	<b>501</b>	<b>842</b>	<b>2,061</b>	<b>22,840,240</b>	<b>670,790</b>	<b>1,813,540</b>	
<b>PERIOD 5b - Site Restoration</b>																						
Period 5b Direct Decommissioning Activities																						
Demolition of Remaining Site Buildings																						
5b.1.1.1	Containment	-	4,215	-	-	-	-	-	632	4,847	-	-	4,847	-	-	-	-	-	-	-	47,002	-
5b.1.1.2	Auxiliary	-	1,094	-	-	-	-	-	164	1,258	-	-	1,258	-	-	-	-	-	-	-	14,669	-
5b.1.1.3	Control	-	125	-	-	-	-	-	19	143	-	-	143	-	-	-	-	-	-	-	1,695	-
5b.1.1.4	Intake	-	133	-	-	-	-	-	20	153	-	-	153	-	-	-	-	-	-	-	1,577	-
5b.1.1.5	LLW Storage Bldg B&C Waste	-	367	-	-	-	-	-	55	422	-	-	422	-	-	-	-	-	-	-	3,926	-
5b.1.1.6	Maintenance Professional Facility	-	857	-	-	-	-	-	128	985	-	-	985	-	-	-	-	-	-	-	9,370	-
5b.1.1.7	Miscellaneous Structures - Clean	-	2,814	-	-	-	-	-	422	3,236	-	-	3,236	-	-	-	-	-	-	-	40,579	-
5b.1.1.8	Radwaste Solidification	-	800	-	-	-	-	-	120	920	-	-	920	-	-	-	-	-	-	-	9,915	-
5b.1.1.9	Sealwell	-	103	-	-	-	-	-	15	118	-	-	118	-	-	-	-	-	-	-	1,251	-
5b.1.1.10	Security Improvements	-	305	-	-	-	-	-	46	351	-	-	351	-	-	-	-	-	-	-	2,380	-
5b.1.1.11	Turbine	-	417	-	-	-	-	-	63	480	-	-	480	-	-	-	-	-	-	-	6,507	-
5b.1.1.12	Turbine Pedestal	-	488	-	-	-	-	-	73	561	-	-	561	-	-	-	-	-	-	-	5,055	-
5b.1.1.13	Fuel Handling	-	527	-	-	-	-	-	79	606	-	-	606	-	-	-	-	-	-	-	6,475	-
5b.1.1	Totals	-	12,244	-	-	-	-	-	1,837	14,081	-	-	14,081	-	-	-	-	-	-	-	150,403	-
Site Closeout Activities																						
5b.1.2	Remove Rubble	-	1,525	-	-	-	-	-	229	1,753	-	-	1,753	-	-	-	-	-	-	-	8,328	-
5b.1.3	Grade & landscape site	-	446	-	-	-	-	-	67	513	-	-	513	-	-	-	-	-	-	-	1,043	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	85	13	98	98	-	-	-	-	-	-	-	-	-	-	668
5b.1	Subtotal Period 5b Activity Costs	-	14,215	-	-	-	-	85	2,145	16,445	98	-	16,347	-	-	-	-	-	-	-	159,774	668
Period 5b Additional Costs																						
5b.2.1	Concrete Crushing	-	512	-	-	-	-	7	78	597	-	-	597	-	-	-	-	-	-	-	2,535	-
5b.2.2	Demolition of ISFSI	-	594	-	-	-	-	28	93	715	-	-	715	-	-	-	-	-	-	-	3,106	80
5b.2.3	Intake Structure Cofferdam	-	213	-	-	-	-	-	32	244	-	-	244	-	-	-	-	-	-	-	1,896	-
5b.2.4	Discharge Structure Cofferdam	-	232	-	-	-	-	-	35	266	-	-	266	-	-	-	-	-	-	-	2,066	-
5b.2.5	Construction Debris	-	-	-	-	-	-	330	50	380	-	-	380	-	-	-	-	-	-	-	-	-
5b.2	Subtotal Period 5b Additional Costs	-	1,550	-	-	-	-	366	287	2,203	-	-	2,203	-	-	-	-	-	-	-	9,603	80
Period 5b Collateral Costs																						
5b.3.1	Small tool allowance	-	137	-	-	-	-	-	21	158	-	-	158	-	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	137	-	-	-	-	-	21	158	-	-	158	-	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																						
5b.4.2	Property taxes	-	-	-	-	-	-	28	3	30	-	-	30	-	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	6,874	-	-	-	-	-	1,031	7,906	-	-	7,906	-	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	558	84	642	-	-	642	-	-	-	-	-	-	-	-	-
5b.4.5	Security Staff Cost	-	-	-	-	-	-	1,161	174	1,335	-	-	1,335	-	-	-	-	-	-	-	-	26,444
5b.4.6	DOC Staff Cost	-	-	-	-	-	-	9,515	1,427	10,942	-	-	10,942	-	-	-	-	-	-	-	-	105,697
5b.4.7	Utility Staff Cost	-	-	-	-	-	-	4,460	669	5,129	-	-	5,129	-	-	-	-	-	-	-	-	51,851
5b.4	Subtotal Period 5b Period-Dependent Costs	-	6,874	-	-	-	-	15,722	3,388	25,985	-	-	25,985	-	-	-	-	-	-	-	-	183,993
5b.0	TOTAL PERIOD 5b COST	-	22,776	-	-	-	-	16,173	5,841	44,790	98	-	44,692	-	-	-	-	-	-	-	169,377	184,741
<b>PERIOD 5 TOTALS</b>		<b>-</b>	<b>22,776</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>16,173</b>	<b>5,841</b>	<b>44,790</b>	<b>98</b>	<b>-</b>	<b>44,692</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>169,377</b>	<b>184,741</b>
<b>TOTAL COST TO DECOMMISSION</b>		<b>7,456</b>	<b>82,706</b>	<b>14,256</b>	<b>18,514</b>	<b>15,313</b>	<b>47,823</b>	<b>742,435</b>	<b>154,138</b>	<b>1,082,641</b>	<b>726,047</b>	<b>303,364</b>	<b>53,230</b>	<b>179,213</b>	<b>224,783</b>	<b>501</b>	<b>842</b>	<b>2,061</b>	<b>24,448,010</b>	<b>948,205</b>	<b>6,449,053</b>	

**Table D-2**  
**Turkey Point Nuclear Plant, Unit 4**  
**SAFSTOR Decommissioning Cost Estimate**  
(thousands of 2015 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			

<b>TOTAL COST TO DECOMMISSION WITH 16.6% CONTINGENCY:</b>					\$1,082,641	thousands of 2015 dollars															
<b>TOTAL NRC LICENSE TERMINATION COST IS 67.06% OR:</b>					\$726,047	thousands of 2015 dollars															
<b>SPENT FUEL MANAGEMENT COST IS 28.02% OR:</b>					\$303,364	thousands of 2015 dollars															
<b>NON-NUCLEAR DEMOLITION COST IS 4.92% OR:</b>					\$53,230	thousands of 2015 dollars															
<b>TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):</b>					226,126	cubic feet															
<b>TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:</b>					2,061	cubic feet															
<b>TOTAL SCRAP METAL REMOVED:</b>					40,952	tons															
<b>TOTAL CRAFT LABOR REQUIREMENTS:</b>					948,205	man-hours															

End Notes:  
n/a - indicates that this activity not charged as decommissioning expense.  
a - indicates that this activity performed by decommissioning staff.  
0 - indicates that this value is less than 0.5 but is non-zero.  
a cell containing " - " indicates a zero value

**APPENDIX E**  
**ISFSI DECOMMISSIONING**

**Table E**  
**Turkey Point Nuclear Plant, Units 3 and 4**  
**ISFSI Decommissioning Cost Estimate**  
**DECON and SAFSTOR Decommissioning Alternatives**  
(thousands of 2015 dollars)

Activity Description	Removal Costs	Packaging Costs	Transport Costs	LLRW Disposal Costs	Other Costs	Total Costs	Burial Volume Class A (cubic feet)	Craft Manhours	Oversight and Contractor Manhours
<b>Decommissioning Contractor</b>									
Planning (characterization, specs and procedures)	-	-	-	-	269	269	-	-	1,216
Decontamination (activated disposition)	635	5	983	1,452	-	3,074	21,386	6,285	-
License Termination (radiological surveys)	-	-	-	-	1,594	1,594	-	14,738	-
<b>Subtotal</b>	<b>635</b>	<b>5</b>	<b>983</b>	<b>1,452</b>	<b>1,863</b>	<b>4,937</b>	<b>21,386</b>	<b>21,023</b>	<b>1,216</b>
<b>Supporting Costs</b>									
NRC and NRC Contractor Fees and Costs	-	-	-	-	411	411	-	-	776
Florida LLRW Inspection Fee	-	-	-	-	42	42	-	-	-
Insurance	-	-	-	-	68	68	-	-	-
Property taxes	-	-	-	-	10	10	-	-	-
Plant energy budget	-	-	-	-	194	194	-	-	-
Security Staff Cost	-	-	-	-	153	153	-	-	3,457
Oversight Staff	-	-	-	-	326	326	-	-	3,803
<b>Subtotal</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,203</b>	<b>1,203</b>	<b>-</b>	<b>-</b>	<b>8,036</b>
<b>Total (w/o contingency)</b>	<b>635</b>	<b>5</b>	<b>983</b>	<b>1,452</b>	<b>3,066</b>	<b>6,140</b>	<b>21,386</b>	<b>21,023</b>	<b>9,252</b>
<b>Total (w/25% contingency)</b>						<b>7,675</b>			

The application of contingency (25%) is consistent with the evaluation criteria referenced by the NRC in NUREG-1757 ("Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. NRC's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Vol. 3, Rev. 1, February 2012)

SECTION 11

COMPARISON REPORT  
Comparative Analysis of Cost Studies  
2010 & 2015 Cost Studies

**COMPARISON REPORT 2010 - 2015**  
**for the**  
**TURKEY POINT NUCLEAR PLANT,**  
**UNITS 3 AND 4**



*prepared for*

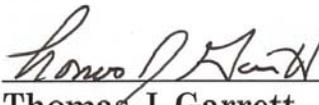
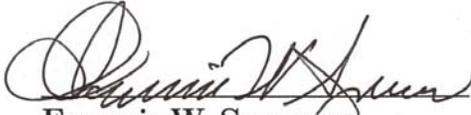
**Florida Power & Light Company**

*prepared by*

**TLG Services, Inc.**  
**Bridgewater, Connecticut**

**November 2015**

APPROVALS

Project Manager	 _____ William A. Cloutier, Jr.	<u>23 Nov 2015</u> Date
Project Engineer	 _____ Thomas J. Garrett	<u>11/23/15</u> Date
Technical Manager	 _____ Francis W. Seymore	<u>11/23/15</u> Date

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**REVISION LOG**

<b>No.</b>	<b>CRA No.</b>	<b>Date</b>	<b>Item Revised</b>	<b>Reason for Revision</b>
0		11-23-2015		Original Issue

## SUMMARY

This document provides a comparative discussion on decommissioning cost estimates prepared for the Turkey Point Nuclear Plant, Units 3 and 4 (Turkey Point) in 2010<sup>[1]</sup> and updated in 2015<sup>[2]</sup> by TLG Services, Inc. (TLG). The estimates described in this document were constructed for a prompt decommissioning scenario following the scheduled cessation of operations, recognizing that there is a one year offset in the scheduled shutdown dates for the two nuclear units. The scope of the two estimates is consistent, including cost elements for license termination, spent fuel management and site restoration activities.

The estimates were generated in 2010 and 2015 dollars, respectively. The 2015, or current estimate, was developed using the basic inventory and plant design information from the 2010, or previous cost model. The data, estimating assumptions and site-specific considerations were reviewed for the 2015 analysis. The cost model was modified where new information was available, updated site-specific information was obtained, or experience from past decommissioning programs justified such changes.

The overall estimate to decommission Turkey Point (for the DECON alternative) increased 28.4% over the five year period between estimates. The increase (or decrease) in the individual cost elements is shown in Table 1.

The cost elements were assigned to one of three subcategories: *NRC License Termination*, *Spent Fuel Management*, and *Site Restoration*. Delegation of cost elements into these categories was for the purpose of comparison (e.g., with NRC financial guidelines) or to permit specific financial treatment (e.g., Asset Retirement Obligation determinations). In reality, there can be considerable interaction or overlap between the activities in the three subcategories.

The subcategory *NRC License Termination* was used to accumulate costs that are consistent with the NRC's definition of decommissioning in its financial assurance regulations (i.e., 10 CFR Part 50.75). The cost reported for this subcategory is generally sufficient to terminate the operating licenses for the two reactors, recognizing that there may be some additional cost impact from spent fuel management. The cost associated with license termination activities increased 29.2% over the five years or approximately 5.3% annually. License termination

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<sup>1</sup> "Decommissioning Cost Analysis for the Turkey Point Nuclear Plant, Units 3 and 4," TLG Document F02-1630-002, Rev. 0, dated December 2010

<sup>2</sup> "Decommissioning Cost Analysis for the Turkey Point Nuclear Plant, Units 3 and 4," TLG Document F02-1714-002, Rev. 0, dated November 2015

costs were most impacted by one time changes in the security organization, waste disposal rates for the higher activity radioactive waste, a larger volume of soil being designated for controlled disposal and additional resources assigned to oversee site remediation and waste characterization activities, as well as, expenses associated with the site decommissioning organization (for example, non-labor costs).

The *Spent Fuel Management* subcategory contains costs anticipated to be incurred once the nuclear units cease operation for the off-loading of the pools either directly to the Department of Energy (DOE) or to the Independent Spent Fuel Storage Installation (ISFSI) for interim storage, and the eventual transfer of fuel from the ISFSI to the DOE. Costs were also included for the operation of the ISFSI until such time that the transfer of all fuel from this facility to an off-site location (e.g., geologic repository or interim facility) is complete. The costs assigned to this subcategory increased 28.3% over the five years. Significant increases in campaign costs for transfer of spent fuel from the pool to the DOE and ISFSI accounted for a majority of the increase.

*Site Restoration* was used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination. This includes structures never exposed to radioactive materials, as well as those facilities that have been decontaminated to appropriate levels. Structures are removed to a depth of three feet below grade and backfilled to conform to local grade. The costs assigned to this subcategory increased 19.0% over the five years. The increase is the result of higher security costs, property taxes, and energy costs, and the inclusion of additional heavy equipment to support demolition activities.

	<b>2010</b>	<b>2015</b>	<b>Delta</b>	<b>Percent</b>	<b>Annual</b>
<b>Cost Center</b>	<b>(\$1000s)</b>	<b>(\$1000s)</b>	<b>(\$1000s)</b>	<b>Change</b>	<b>Change</b>
License Termination	932,988	1,205,581	272,593	29.2	5.3
Spent Fuel Management	374,006	479,670	105,664	28.3	5.1
Site Restoration	79,223	94,298	15,075	19.0	3.5
<b>Total</b>	<b>1,386,216</b>	<b>1,779,550</b>	<b>393,334</b>	<b>28.4</b>	<b>5.1</b>

The rationale for specific changes in several major cost centers is discussed in more detail within the following narrative. Comparisons are focused on permutations in the technical work scope and modifications to assumptions that have affected the cost of decommissioning. Inflationary effects, while a factor, are generally ignored for purposes of this analysis.

## COMPARATIVE ANALYSIS

TLG completed a decommissioning cost analysis for Turkey Point in 2010. The analysis provided the Florida Power & Light Company (FPL), the owner and operator of the nuclear units, with the projected costs (in 2010 dollars) to completely decontaminate and dismantle the station following the normal cessation of plant operations. For purposes of this comparison, this analysis is referred to as the 2010 estimate or previous analysis.

In 2015, TLG updated the cost analysis for FPL. The current analysis uses the physical plant inventory and design information from the previous analysis. This data was reviewed, along with the assumptions and other site-specific considerations, and modified or updated where new information was available or experience from ongoing decommissioning programs justified such changes. Since the update relied upon 2015 economic data, the analysis is referred to as the 2015 estimate or current analysis.

Generally, escalation of the various cost components in a decommissioning analysis (with the exception of those costs associated with radioactive waste disposal), follows "standard" cost indices. However, such indices can only be applied successfully to a static model, *i.e.*, where the bases against which the indices are applied have not undergone significant change. In the period between the last two analyses (the 2010 and 2015 financial years), new cost elements have been added and older cost elements revised. With this in mind, the following discussion encompasses the major areas of difference between the two estimates.

In 2010, the estimate to promptly decommission Turkey Point (DECON alternative) was estimated at approximately \$1,386.2 million (in 2010 dollars). The comparable cost in 2015 is \$1,779.6 million (in 2015 dollars). This represents a 28.4% increase in the overall cost. Major areas of change in the two estimates are shown in Table 1.

The decommissioning scope of the current cost estimate has not significantly changed from that evaluated presented in 2010.

1. Program Management and Security

The organization identified to oversee the decommissioning project and manage the day-to-day activities is similar in structure to the operating organization, although much reduced in size and function.

The cost category includes several contributors:

- Plant Staff: comprised of the decision-making individuals at the site, administrative, secretarial and/or clerical support, plant management responsible for the facility's operation, maintenance, as well as compliance with the existing operating license and technical specifications during the initial preparation phase, quality assurance and quality surveillance, engineering support, planning and cost control personnel, health physics and radiation protection, industrial safety, waste management, procurement, document control, and field superintendents for work force direction
- Engineering: supplemental workforce employed in the preparation stages to support the reconfiguration of the plant for decommissioning, develop specifications, procedures and work packages for both in-house and subcontracted activities, and perform related studies and supporting analyses
- Security: personnel comprising the on-site, plant security force including surveillance personnel, access/egress control and processing personnel, a rapid response contingent, training and supervisory personnel
- Decommissioning Operations Contractor (DOC): organization contracted to manage the execution of the decontamination and dismantling activities including direct supervision of trades and oversight of subcontractors engaged in specialty activities such as reactor vessel segmentation

Table 2 provides a comparison of the Plant and DOC peak staffing levels for each decommissioning period and corresponding cost per month. Staffing levels are relatively consistent for the major decommissioning periods.

A general increase in wages and benefits over the five year period is the primary contributor to the 17.1% increase in Plant and DOC organizational costs of \$83.7 million.

The length of the decommissioning schedule (from the cessation of operations to the termination of the site licenses) in the 2015 cost model is unchanged from the 2010 schedule (Table 3).

In January 2007, the NRC approved a final rule that enhanced its security regulations governing the design basis threat (DBT). This rule imposed security requirements similar to those previously imposed by the Commission's April 29, 2003, DBT Orders. However, the new rule also modified and enhanced the DBT based on experience and insights gained by the Commission during implementation of the Orders, and extensive consideration of the factors specified in the Energy Policy Act of 2005.

Based upon the industry's response to the NRC's rulemaking, and input from active decommissioning projects (for example, Vermont Yankee), the security cost model was adjusted to increase the number of personnel over the project duration (Table 4). An increase of approximately 20% in wages contributed to the overall 65.9% increase of \$91.9 million in security costs.

2. Spent Fuel Management (ISFSI Related)

For purposes of generating a comprehensive post-shutdown cost, the cost to manage the spent fuel generated over the operating life of Turkey Point was included within the decommissioning estimate until such time that the DOE can complete the transfer of the assemblies off-site. The current (2015) analysis assumes that the DOE will begin the process of removing spent fuel from the Turkey Point site in 2032 (based upon a 2030 industry-wide start date). The process is expected to be completed by the year 2073. The schedule is unchanged from 2010 (Table 5).

Slight decreases in the costs for the dry storage modules (HSMs and DSCs) and cask loading were off-set by significant increases in campaign costs for transfer of spent fuel from the pool to the DOE and/or ISFSI. The increase in campaign costs accounted for a majority of the 31.7% increase of \$69.7 million.

Unit Costs	2010	2015
Dry Storage Canister (DSC)	\$900,000	\$823,698
Horizontal Storage Module (HSM)	\$483,000	\$431,230
Cask Loading/Transfer Cost	\$575,000	\$392,600
Pool to DOE Campaign Cost	\$175,000	\$3,280,100
Pool to ISFSI Campaign Cost	\$350,000	\$3,280,100
ISFSI Unloading Cost	\$100,000	\$196,300
ISFSI Unloading Campaign Cost	\$0	\$820,025

3. Low-Level Radioactive Waste Disposal

Consistent with the 2010 estimates, the current cost model assumes that the majority of the low-level radioactive waste requiring controlled disposal (Class A as defined by 10 CFR §61.55) is sent to EnergySolutions' facility in Clive, Utah.

Disposal costs for Class A waste were based upon FPL's Life of Plant Agreement with EnergySolutions. There was a nominal increase in disposal rates. The waste inventory, against which the disposal rates are applied, was increased with a one-time change in the packaging density for containerized waste.

EnergySolutions is not licensed to receive the higher activity portion (Classes B and C) of the decommissioning waste stream. In 2010, for estimating purposes, rates for the Barnwell facility were used (even though FPL did not have access to the site). Since that time, the Texas Compact opened a new disposal facility that is licensed to receive Class B and C waste. The disposal site, operated by Waste Control Specialists, is able to receive limited quantities of waste from non-Compact generators. As such, the 2015 estimates for Class B and C disposal were based upon available rate information for the Texas facility.

The 32.3% increase in waste disposal costs (\$37.6 million) is due to the escalation of EnergySolutions rates as well as the change in the cost basis for the disposal of Class B and C waste. Also contributing to the increase was additional biological shield concrete being designated for controlled disposal and the disposition of the horizontal storage modules used to store fuel and targeted for remediation. Additionally, contaminated soils from past construction projects (approximately 5,220 cubic yards) were added to the current estimate.

4. Removal

Contract labor is used to decontaminate, remove, and package the plant inventory, as well as to support the dismantling and demolition of the physical structures. The dismantling process is labor-intensive and the cost model assumes that a common laborer performs a majority of the required tasks, with support from the various skilled trades. While wage rates for the craft, as shown in Table 7, did not significantly increase over the five year period, the hours expended for the additional work scope (for example, containment concrete and contaminate soil) did increase, approximately 19%.

5. Insurance and Regulatory Fees

The 2010 estimates included provisions for both nuclear liability and property insurance throughout the active decommissioning phase. Operating premiums were reduced once the units ceased operation based upon the guidance and the limits for coverage defined in the NRC’s proposed rulemaking “Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors.” The operating premiums for the two policies are shown below for both the 2010 and 2015 timeframes.

Despite higher starting premiums in 2015, the property component was significantly reduced shortly after plant shutdown in the 2015 cost model, based upon planning experience at Vermont Yankee.

NRC fees are associated with the Part 50 operating license(s) and for the oversight and regulatory review anticipated (based upon industry experience) for a decommissioning project. As shown below, the annual licensing cost has increased over the past five years, as well as the hourly rate.

Emergency planning fees are included while spent fuel remains on site. FEMA fees are discontinued shortly after the cessation of operations and defueling. However, state fees are applied until such time that the fuel has been removed from the site.

Annual Cost (per unit)	2010	2015
Nuclear Liability Insurance Premium	\$1,014,569	\$1,183,342
Nuclear Property Insurance Premium <sup>[1]</sup>	\$2,386,000	\$4,134,000
NRC License Fee	\$122,000	\$237,000
Annual Cost (site)	2010	2015
Emergency Planning Fee (state and county)	\$816,808	\$917,488
Other	2010	2015
NRC Hourly Rate (e.g., for reviews, inspections)	\$257	\$268

<sup>[1]</sup> Both Units Operating Primary Premium

6. Transportation

It was assumed in both the 2010 and 2015 cost models that the majority of the low-level radioactive waste requiring controlled disposal (Class A) would be sent to EnergySolutions' burial facility in Clive, Utah. The 55% increase in transportation costs is due to a combination of higher tariffs, fuel surcharges and the additional shipments associated with the larger number of waste packages and the contaminated soil and concrete.

7. Energy

Energy costs are included for critical plant systems, temporary power, offices and other facilities housing site personnel, security and other site services. The increase in energy costs in the 2015 estimate is a direct result of the purchase power rate increasing from \$.117 per kilowatt hour in 2010 to \$.158 per kilowatt hour in 2015.

8. Packaging

Several factors contributed to the increased packaging costs. The 2015 cost model assumed a lower waste packaging density than the prior study (based upon industry experience). The change increased the number of packages required for the plant equipment and commodities designated for controlled disposal.

The costs for packaging the reactor vessel internals, specifically the GTCC material, also increased (GTCC is packaged in the same containers used for spent fuel - dry shielded canisters and horizontal storage modules). The number of GTCC canisters increased in the 2015 cost model due assumed reduction in the canister's payload capacity (based upon Maine Yankee experience).

9. Property Taxes

Property taxes are included as a site operating cost during decommissioning. The 2010 estimate assumed that taxes would continue to be assessed on existing plant structures and equipment until they were physically removed. By comparison, the 2015 estimate assumes no significant value for the site structures and includes only a value on the land (protected area) during active decommissioning and only on ISFSI footprint thereafter.

However, property taxes increased \$2.3 million in the 2015 estimate (Table 1), as a result of a change in how the tax would be assessed.

10. Off-Site Waste Processing

Off-site waste processing rates as provided in the EnergySolutions contract decreased between 2010 and 2015. The reduction in rates accounts for the majority of the \$6.6 million decrease in costs (since the total volume has essentially remained unchanged).

11. Site Characterization and License Termination Surveys

The 2015 analysis included the addition of a remedial action survey program (incorporating industry experience) in support of decontamination and dismantling work. This activity accounted for \$12.8 million of the \$19.3 million increase. Characterization and license termination survey cost also increased with higher labor (for example, health physics technicians) and material cost increases.

12. Spent Fuel Pool Isolation

The isolation cost includes the engineering, facility modifications, and the capital improvements necessary to segregate the pool areas and reduce the protected boundary, so that decommissioning operations can proceed expeditiously. The 2015 value for this cost element represents an annual increase of 2% over the five year period.

13. Fixed Overhead

Overhead charges were updated from the 2010 estimate, resulting in an \$11.2 million dollar increase. The annual site cost, as provided for Turkey Point, increased from approximately \$1.1 million in 2010 to \$3.6 million in 2015. The increase was applied across the active decommissioning periods.

**TABLE 1  
COST COMPARISON  
DECON ALTERNATIVE**

<b>Cost Center</b>	<b>2010 (\$1000s)</b>	<b>2015 (\$1000s)</b>	<b>Delta (\$1000s)</b>	<b>Percent Change</b>	<b>Annual Change</b>
Decontamination	20,913	22,823	1,910	9.1	1.8
Removal <sup>[1]</sup>	149,685	182,248	32,563	21.8	4.0
Packaging	33,709	48,546	14,837	44.0	7.6
Transportation	32,737	50,920	18,183	55.5	9.2
Radioactive Waste Disposal	116,586	154,188	37,602	32.3	5.8
Off-site Waste Processing	33,548	26,902	-6,646	-19.8	-4.3
Program Management <sup>[2]</sup>	488,511	572,181	83,669	17.1	3.2
Security	139,413	231,286	91,873	65.9	10.7
Spent Fuel Pool Isolation	19,129	21,250	2,121	11.1	2.1
Spent Fuel Management <sup>[3]</sup>	219,653	289,358	69,705	31.7	5.7
Insurance and Regulatory Fees	45,902	46,349	447	1.0	0.2
Energy	29,101	40,588	11,487	39.5	6.9
Characterization/Surveys	17,988	37,306	19,318	107.4	15.7
Property Taxes	277	2,589	2,312	834.8	56.4
Misc. Equip / Site Services	13,139	14,679	1,540	11.7	2.2
Fixed Overhead	18,429	29,643	11,214	60.8	10.0
INPO , NEI Fees	6,907	7,619	712	10.3	2.0
Florida LLRW Inspection Fee	591	1,074	483	81.8	12.7
<b>Total <sup>[4]</sup></b>	<b>1,386,216</b>	<b>1,779,550</b>	<b>393,334</b>	<b>28.4</b>	<b>5.1</b>

<b>Cost Center</b>	<b>2010 (\$1000s)</b>	<b>2015 (\$1000s)</b>	<b>Delta (\$1000s)</b>	<b>Percent Change</b>	<b>Annual Change</b>
License Termination	932,988	1,205,581	272,593	29.2	5.3
Spent Fuel Management <sup>[5]</sup>	374,006	479,670	105,664	28.3	5.1
Site Restoration	79,223	94,298	15,075	19.0	3.5
<b>Total <sup>[4]</sup></b>	<b>1,386,216</b>	<b>1,779,550</b>	<b>393,334</b>	<b>28.4</b>	<b>5.1</b>

[1] Includes miscellaneous equipment costs

[2] Includes engineering costs

[3] Excludes program management costs (staffing) but includes costs for dry shielded storage canisters and horizontal storage modules, spent fuel loading/transfer/spent fuel pool O&M and EP fees

[4] Columns may not add due to rounding

[5] Includes period-dependent costs such as Program Management costs

**TABLE 2**  
**DECOMMISSIONING STAFFING COMPARISON**

		<b>2010</b>	<b>2010</b>	<b>2015</b>	<b>2015</b>
		<b>Peak</b>	<b>Peak</b>	<b>Peak</b>	<b>Peak</b>
		<b>Staffing</b>	<b>Cost/Month</b>	<b>Staffing</b>	<b>Cost/Month</b>
		<b>(persons)</b>	<b>(\$1000s)</b>	<b>(persons)</b>	<b>(\$1000s)</b>
<b>Unit 3</b>					
Period 1					
Preparations	FPL	204	2,254	204	2,669
	DOC	61	829	61	902
Period 2					
Decommissioning	FPL	141	1,591	141	1,896
	DOC	76	1,034	76	1,134
Period 3					
Site Restoration	FPL	17	206	17	247
	DOC	27	372	27	415
<b>Unit 4</b>					
Period 1					
Preparations	FPL	166	1,782	166	2,112
	DOC	45	594	45	646
Period 2					
Decommissioning	FPL	141	1,592	140	1,891
	DOC	76	1,034	76	1,134
Period 3					
Site Restoration	FPL	17	206	17	247
	DOC	27	372	27	415

**TABLE 3  
PROJECT SCHEDULE COMPARISON**

	<b>2010</b>	<b>2015</b>
	<b>(months)</b>	<b>(months)</b>
<b>Unit 3</b>		
Period 1 – Preparations	18	18
Period 2 – Decommissioning Operations	73	73
Period 3 – Site Restoration	23	23
ISFSI Operations	371	371
ISFSI Decommissioning and Demolition	6	6
<b>TOTAL</b>	<b>491</b>	<b>491</b>
<b>Unit 4</b>		
Period 1 – Preparations	20	20
Period 2 – Decommissioning Operations	62	62
Period 3 – Site Restoration	23	23
ISFSI Operations	371	371
ISFSI Decommissioning and Demolition	6	6
<b>TOTAL</b>	<b>483</b>	<b>483</b>

**TABLE 4  
SECURITY FORCE COMPARISON**

	<b>2010</b>	<b>2015</b>
	<b>Peak Guard Force</b>	
	(no. of full-time equivalents)	
<b>Unit 3</b>		
Period 1 – Preparations	75.5	70.5
Period 2 – Decommissioning Operations	53.4	60.5
Period 3 – Site Restoration	16.9	21.0
ISFSI Operations	13.5	15.5
ISFSI Decommissioning and Demolition	3.6	2.5
<b>Unit 4</b>		
Period 1 – Preparations	22.4	60.5
Period 2 – Decommissioning Operations	63.3	90.0
Period 3 – Site Restoration	16.9	21.0
ISFSI Operations	13.5	15.5
ISFSI Decommissioning and Demolition	3.6	2.5

Note:

The guard force is allocated equally between the units during Site Restoration and the ISFSI Operations period

**TABLE 5  
SPENT FUEL VARIABLES**

	<b>2010</b>	<b>2015</b>
DOE Start Date (year)	2030	2030
DSC's or TADs Required to Empty Spent Fuel Pools		
DOE Direct (TADs)	24	24
ISFSI (DSCs)	54	60
Maximum Number of HSMs on ISFSI	120	120
Final Year of DOE Pickup	2072	2072
ISFSI Operating Period (post-Unit 2 shutdown) (years)	40	40
GTCC Canisters	6	10

Notes:

1. GTCC canister total includes an additional modified DSC (per unit) for the material classified as GTCC residing in the spent fuel pools
2. The payload capacity of the GTCC canister was reduced in the 2015 cost study based upon Maine Yankee experience, i.e., additional canisters were required for the same mass

**TABLE 6  
 DECOMMISSIONING WASTE SUMMARY**

				<b>2010</b>	<b>2015</b>
Waste Class	Waste Form	Cost Basis	Class <sup>[1]</sup>	Waste Volume (cubic feet)	Waste Volume (cubic feet)
Low-Level Radioactive Waste (at near-surface disposal facility)	Containerized and Bulk Debris	EnergySolutions	A	202,374	327,035
		WCS	B	2,346	2,466
		WCS	C	1,952	1,683
	Contaminated Soil	EnergySolutions <sup>[2]</sup>	A	59,300	162,654
Greater than Class C (geologic repository)	Modified DSCs	Spent Fuel Equivalent	GTCC	975	4,123
<b>Total Disposal Volume</b>				<b>266,946</b>	<b>497,960</b>
Processed/Conditioned (at off-site recycling center)		Recycling Vendors	A	252,302	252,292

Notes:

1. Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55
2. Disposal cost discounted based upon industry experience for the large soil volume and low contamination level

**TABLE 7**  
**WAGES and PERSON-HOUR COMPARISON**

<b>Labor Costs</b>				
	<b>Labor Category</b>	<b>2010 (\$/hour)</b>	<b>2015 (\$/hour)</b>	<b>Change (%)</b>
	Laborers	32.61	34.75	6.2%
	Craft	51.38	51.97	1.1%
	Foreman	55.88	57.06	2.1%
<b>Person-Hours</b>		<b>2010 (hours)</b>	<b>2015 (hours)</b>	<b>Change (%)</b>
	Laborer/Craft	1,381,816	1,693,115	18.4

## CONCLUSION

The total cost to decommission the Turkey Point nuclear units increased 28.4% over the five year period between estimates or approximately 5.1% annually. The value is not indicative of the majority of the cost drivers, but skewed with the large increase in security and spent fuel management costs.

As shown in Table 1, license termination costs (or the cost associated with “decommissioning” as defined by the NRC in its financial assurance regulations) increased 29.2% over the five year period (for an average annual increase of 5.3%). As discussed in the previous narrative, the change is the result of the increase in the security organization, energy costs, the increase in the decommissioning waste stream (from a change in the waste packaging density and additional concrete and soil), as well as general increases in labor and material costs.

The spent fuel management category contains costs associated with the interim storage of fuel at the Turkey Point site until such time that the DOE is able to take possession. The costs estimated for this activity increased 28.3% from 2010. The contributors are significant increases in campaign costs for transfer of spent fuel from the pool to the DOE and ISFSI.

Site restoration (used to capture costs associated with the dismantling and demolition of buildings and facilities demonstrated to be free from contamination) showed an increase of 19.0% over the five years. Higher energy, property taxes and security costs contributed to the overall increase.