March 30, 2021

L-2021-015
10 CFR 50.75(f)(1)
10 CFR 72.30(c)

Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Docket No. 72-61

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Docket No. 72-62

NextEra Energy Seabrook, LLC
Seabrook Station
Docket No. 50-443
Docket No. 72-63

NextEra Energy Point Beach, LLC
Point Beach Units 1 and 2
Docket Nos. 50-266, 50-301
Docket No. 72-05

Decommissioning Funding Status Reports / Independent Spent Fuel Storage Installation (ISFSI) Financial Assurance Update

Pursuant to 10 CFR 50.75(f)(1) and 10 CFR 72.30(c), enclosed are the Decommissioning Funding Status (DFS) Reports and Independent Spent Fuel Storage Installation Financial Assurance Update for the following units:

1. St. Lucie Units 1 and 2
2. Turkey Point Units 3 and 4
3. Seabrook Station
4. Point Beach Units 1 and 2

Florida Power and Light Company (FPL) is the sole owner of Turkey Point Units 3 and 4 and St. Lucie Unit 1. FPL, Florida Municipal Power Agency, and Orlando Utilities Commission own St. Lucie Unit 2. The report for St. Lucie Unit 2 provides the status of decommissioning funding for all three owners of that unit.

Florida Power & Light Company
700 Universe Boulevard, Juno Beach, FL 33408

A001
NMSS26
NMSS
NRR

NextEra Energy Seabrook, LLC (Seabrook), Hudson Light and Power Department, Massachusetts Municipal Wholesale Electric Company, and Taunton Municipal Lighting Plant own Seabrook Station. The report for Seabrook Station provides the status of decommissioning funding for all four owners of that unit.

NextEra Energy Point Beach, LLC is the sole owner of Point Beach Units 1 and 2.

This letter contains no new commitments and no revisions to existing commitments.

Should there be any questions, please contact Stephanie Castaneda at (561) 805-2556.

William Parks
General Manager, Safety Assurance and Learning
Florida Power & Light Company

Enclosures (2)
Attachments (3)

Enclosure 1

Decommissioning Funding Status Reports
10 CFR 50.75(f)(1)

- St. Lucie Units 1 and 2
- Turkey Point Units 3 and 4
- Seabrook Station
- Point Beach Units 1 and 2

St. Lucie Nuclear Plant – Unit 1
Florida Power and Light Company (FPL),
Decommissioning Funding Status Report

1. **The minimum decommissioning fund estimate pursuant to 10 CFR 50.75(b) and (c).**

Plant Owner (% Ownership)	NRC Minimum (a)
FPL (100%)	497,783,346

(a) Refer to St. Lucie Unit 1 for calculation assumptions

2. **The amount accumulated at the end of the calendar year preceding the date of the report. (Trust fund balance is net of taxes)**

	Total[1]
FPL (100%)	1,464,701,756

3. **Projected Funds at Shutdown (2% real rate of return).**

	Total
FPL (100%) (see note (b))	1,978,152,430

(b) Pursuant to Florida Public Service Commission (FPSC) Order No. PSC-16-0250-PAA-EI, customer contributions to the decommissioning trust remain at zero effective June 29, 2016.

4. **Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v).** None

5. **Any modifications to a licensee's method of providing financial assurance occurring since the last submitted report.** None

6. **Any material changes to trust agreements.** None

[1] NRC letter dated November 26, 2008, St. Lucie Plant, Unit Nos. 1 and 2 – Biennial Decommissioning Funding Report (TAC Nos. MD9354 and MD9355), directed FPL to report all funds within the trust as designated for radiological decommissioning purposes since FPL does not earmark each cost component of decommissioning within the trust. However, the trust includes non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the Florida Public Service Commission (FPSC). FPL understands that under NRC guidance, either an order of the FPSC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, St Lucie Unit 1 allocates the trust account amounts by license termination, spent fuel management and site restoration costs based on assumptions from the decommissioning cost study filed in December 2020 with the FPSC

ST. LUCIE NUCLEAR PLANT - UNIT 1
NRC Minimum Decommissioning Cost Determination

NRC Minimum = $101.58 million X (0.65L + 0.13E + 0.22B)

Where:

$101.58 million is value for reference PWR in 1986 dollars

L = Labor escalation factor to current year[3]

E = Energy escalation factor to current year[4]

B = LLRW escalation factor to current year[5]

#	Item Description	Value
1	Labor escalation factor for Quarter 4, 2020[3]	139.3
2	Base adjustment factor from NUREG-1307 [2]	1.98
3	Escalation factor from NUREG-1307	100
4	L = #1 times #2 divided by #3	2.76
5	Electric power escalation factor, 2020 [6]	232.7
6	Electric power escalation factor for Jan., 1986 from NUREG-1307	114.2
7	Fuel escalation factor for 2020 [7]	209.8
8	Fuel escalation factor for Jan., 1986 from NUREG-1307	82
9	P = #5 divided by #6	2.04
10	F = #7 divided by #8	2.56
11	E = 0.58P(#9) + 0.42F(#10) per NUREG-1307	2.26
12	Value of B from Table 2.1 of NUREG-1307 [5]	12.793
13	0.65L(#4) + 0.13E(#11) + 0.22B(#12)	4.90
14	1986 minimum-millions of dollars for PWR	101.58
15	2020 minimum-millions of dollars: #13 times #14	497.78

[2] NUREG 1307, Rev 18, Table 3.2

[3] NUREG 1307 specified that source is Bureau of Labor Statistics Data, Employment Cost Index, Series CIU2010000000220I (South Region)

[4] NUREG 1307 specifies that source is a weighted calculation using Bureau of Labor Statistics Data, Producer Price Index-Commodities, Series wpu0573 (light fuel oils) and wpu0543 (industrial electric power).

[5] NUREG 1307 provides a value for B in Table 2 1.

[6] December 2020 value is 232.7 (See note #4) Information was preliminary as of 01/31/21.

[7] December 2020 value is 209.8 (See note #4) Information was preliminary as of 01/31/21.

ST. LUCIE NUCLEAR PLANT - UNIT 1

The St. Lucie Unit 1 trust includes non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the Florida Public Service Commission (FPSC). FPL understands that under NRC guidance, either an order of the FPSC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, the data summarized below allocates the NRC license termination portion of the trust fund balance based upon percentages in FPL's most recent FPSC decommissioning cost study. St. Lucie Unit 1 is utilizing the formula method to demonstrate financial assurance pursuant to 10CFR 50.75(b).

Florida Power and Light Company		
Decommissioning Trust Fund - License Termination Funds		
As of December 31, 2020		
Energy Solutions Cost Study (thousands of $2020)		**St. Lucie Unit 1**
License Termination		651,106
Spent Fuel Management		243,383
Site Restoration		28,912
Total		**923,401**
Category %		
License Termination		70.51%
Spent Fuel Management		26.36%
Site Restoration		3.13%
Total		**100%**
Projected Trust Fund Balance at Shutdown		**1,978,152,430**
Projection at Shutdown - License Termination Portion (Allocation based on Energy Solutions Study)		**1,394,829,458**

St. Lucie Nuclear Plant – Unit 2
Florida Power and Light Company (FPL),
Florida Municipal Power Agency (FMPA),
Orlando Utilities Commission (OUC)
Decommissioning Funding Status Report

1. **The minimum decommissioning fund estimate pursuant to 10 CFR 50.75(b) and (c).**

Plant Owner (% Ownership)	NRC Minimum (a)
FPL (85.10449%)	423,635,978
FMPA (8.806%)	43,834,801
OUC (6.08951%)	30,312,567
Total	**497,783,346**

(a) Refer to St. Lucie Unit 2 for calculation assumptions

2. **The amount accumulated at the end of the calendar year preceding the date of the report. (Trust fund balances are net of taxes)**

	Total[8]
FPL (85.10449%)	1,259,139,601
FMPA (8.806%)	95,074,458
OUC (6.08951%)	47,076,186
Total	**1,401,290,244**

3. **Projected Funds at Shutdown (2% real rate of return).**

	Total
FPL (85.10449%) (see note (b))	1,957,300,176
FMPA (8.806%) (see note (c))	147,790,803
OUC (6.08951%) (see note (c))	73,178,722
Total	**2,178,269,702**

(b) Pursuant to Florida Public Service Commission (FPSC) Order No. PSC-16-0250-PAA-EI, customer contributions to the decommissioning trust remain at zero effective June 29, 2016.

(c) Assumes no contributions to the fund.

4. **Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v).** None

5. **Any modifications to a licensee's method of providing financial assurance occurring since the last submitted report.** None

6. **Any material changes to trust agreements.** None

[8] NRC letter dated November 26, 2008, St. Lucie Plant, Unit Nos. 1 and 2 – Biennial Decommissioning Funding Report (TAC Nos. MD9354 and MD9355), directed FPL to report all funds within the trust as designated for radiological decommissioning purposes since FPL does not earmark each cost component of decommissioning within the trust. However, the trust includes non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the Florida Public Service Commission (FPSC). FPL understands that under NRC guidance, either an order of the FPSC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, St. Lucie Unit 2, allocates the trust account amounts by license termination, spent fuel management and site restoration costs based on assumptions from the decommissioning cost study filed in December 2020 with the FPSC.

ST. LUCIE NUCLEAR PLANT - UNIT 2
NRC Minimum Decommissioning Cost Determination

NRC Minimum = $101.58 million X (0.65L + 0.13E + 0.22B)

Where:

$101.58 million is value for reference PWR in 1986 dollars

L = Labor escalation factor to current year[10]

E = Energy escalation factor to current year[11]

B = LLRW escalation factor to current year[12]

#	Item Description	Value
1	Labor escalation factor for Quarter 4, 2020 [10]	139.3
2	Base adjustment factor from NUREG-1307 [9]	1.98
3	Escalation factor from NUREG-1307	100
4	L = #1 times #2 divided by #3	2.76
5	Electric power escalation factor, 2020[13]	232.7
6	Electric power escalation factor for Jan., 1986 from NUREG-1307	114.2
7	Fuel escalation factor for 2020 [14]	209.8
8	Fuel escalation factor for Jan., 1986 from NUREG-1307	82
9	P = #5 divided by #6	2.04
10	F = #7 divided by #8	2.56
11	E = 0.58P(#9) + 0.42F(#10) per NUREG-1307	2.26
12	Value of B from Table 2.1 of NUREG-1307 [12]	12.793
13	0.65L(#4) + 0.13E(#11) + 0.22B(#12)	4.90
14	1986 minimum-millions of dollars for PWR	101.58
15	2020 minimum-millions of dollars: #13 times #14	497.78

[9] NUREG 1307, Rev 18, Table 3.2

[10] NUREG 1307 specified that source is Bureau of Labor Statistics Data, Employment Cost Index, Series CIU2010000000220I (South Region).

[11] NUREG 1307 specifies that source is a weighted calculation using Bureau of Labor Statistics Data, Producer Price Index-Commodities, Series wpu0573 (light fuel oils) and wpu0543 (industrial electric power).

[12] NUREG 1307 provides a value for B in Table 2.1.

[13] December 2020 value is 232.7 (See note #11) Information was preliminary as of 01/31/21.

[14] December 2020 value is 209.8 (See note #11) Information was preliminary as of 01/31/21.

ST. LUCIE NUCLEAR PLANT - UNIT 2

The St. Lucie Unit 2 trust includes non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the Florida Public Service Commission (FPSC). FPL understands that under NRC guidance, either an order of the FPSC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, the data summarized below allocates the NRC license termination portion of the trust fund balance based upon percentages in FPL's most recent FPSC decommissioning cost study. St. Lucie Unit 2 is utilizing the formula method to demonstrate financial assurance pursuant to 10CFR 50.75(b).

Florida Power and Light Company		
Decommissioning Trust Fund - License Termination Funds		
As of December 31, 2020		
Energy Solutions Cost Study (thousands of $2020)		**St. Lucie Unit 2**
License Termination		603,633
Spent Fuel Management		185,930
Site Restoration		34,497
Total		**824,060**
Category %		
License Termination		73.25%
Spent Fuel Management		22.56%
Site Restoration		4.19%
Total		**100%**
Projected Trust Fund Balance at Shutdown		**2,178,269,702**
Projection at Shutdown - License Termination Portion (Allocation based on Energy Solutions Study)		**1,595,606,479**

Turkey Point Nuclear Plant – Unit 3
Florida Power and Light Company (FPL),
Decommissioning Funding Status Report

1. **The minimum decommissioning fund estimate pursuant to 10 CFR 50.75(b) and (c).**

Plant Owner (% Ownership)	NRC Minimum (a)
FPL (100%)	481,568,240

(a) Refer to Turkey Point Unit 3 for calculation assumptions

2. **The amount accumulated at the end of the calendar year preceding the date of the report. (Trust fund balance is net of taxes)**

	Total[15]
FPL (100%)	1,193,964,514

3. **Projected Funds at Shutdown (2% real rate of return).**

	Total
FPL (100%) (see note (b))	2,230,990,206

(b) Pursuant to Florida Public Service Commission (FPSC) Order No. PSC-16-0250-PAA-EI, customer contributions to the decommissioning trust remain at zero effective June 29, 2016.

4. **Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v).** None

5. **Any modifications to a licensee's method of providing financial assurance occurring since the last submitted report.** None

6. **Any material changes to trust agreements.** None

[15] NRC letter dated November 26, 2008, St. Lucie Plant, Unit Nos. 1 and 2 – Biennial Decommissioning Funding Report (TAC Nos. MD9354 and MD9355), directed FPL to report all funds within the trust as designated for radiological decommissioning purposes since FPL does not earmark each cost component of decommissioning within the trust. However, the trust includes non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the Florida Public Service Commission (FPSC). FPL understands that under NRC guidance, either an order of the FPSC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, Turkey Point Unit 3, allocates the trust account amounts by license termination, spent fuel management and site restoration costs based on assumptions from the decommissioning cost study filed in December 2020 with the FPSC

TURKEY POINT NUCLEAR PLANT - UNIT 3
NRC Minimum Decommissioning Cost Determination

NRC Minimum = $98.27 million X (0.65L + 0.13E + 0.22B)

Where:

$98.27 million is value for reference PWR in 1986 dollars

L = Labor escalation factor to current year[17]

E = Energy escalation factor to current year[18]

B = LLRW escalation factor to current year[19]

#	Item Description	Value
1	Labor escalation factor for Quarter 4, 2020 [17]	139.3
2	Base adjustment factor from NUREG-1307 [16]	1.98
3	Escalation factor from NUREG-1307	100
4	L = #1 times #2 divided by #3	2.76
5	Electric power escalation factor, 2020 [20]	232.7
6	Electric power escalation factor for Jan., 1986 from NUREG-1307	114.2
7	Fuel escalation factor for 2020 [21]	209.8
8	Fuel escalation factor for Jan., 1986 from NUREG-1307	82
9	P = #5 divided by #6	2.04
10	F = #7 divided by #8	2.56
11	E = 0.58P(#9) + 0.42F(#10) per NUREG-1307	2.26
12	Value of B from Table 2.1 of NUREG-1307 [19]	12.793
13	0.65L(#4) + 0.13E(#11) + 0.22B(#12)	4.90
14	1986 minimum-millions of dollars for PWR	98.27
15	2020 minimum-millions of dollars: #13 times #14	481.57

[16] NUREG 1307, Rev 17, Table 3.2

[17] NUREG 1307 specified that source is Bureau of Labor Statistics Data, Employment Cost Index, Series CIU2010000000220I (South Region).

[18] NUREG 1307 specifies that source is a weighted calculation using Bureau of Labor Statistics Data, Producer Price Index-Commodities, Series wpu0573 (light fuel oils) and wpu0543 (industrial electric power).

[19] NUREG 1307 provides a value for B in Table 2.1.

[20] December 2020 value is 232.7 (See note #18) Information was preliminary as of 01/31/21.

[21] December 2020 value is 209.8 (See note #18) Information was preliminary as of 01/31/21.

TURKEY POINT NUCLEAR PLANT - UNIT 3

The Turkey Point Unit 3 trust includes non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the Florida Public Service Commission (FPSC). FPL understands that under NRC guidance, either an order of the FPSC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, the data summarized below allocates the NRC license termination portion of the trust fund balance based upon percentages in FPL's most recent FPSC decommissioning cost study. Turkey Point Unit 3 is utilizing the formula method to demonstrate financial assurance pursuant to 10CFR 50.75(b).

Florida Power and Light Company		
Decommissioning Trust Fund - License Termination Funds		
As of December 31, 2020		
Energy Solutions Cost Study (thousands of $2020)		**Turkey Point Unit 3**
License Termination		484,062
Spent Fuel Management		144,704
Site Restoration		23,879
Total		**652,645**
Category %		
License Termination		74.17%
Spent Fuel Management		22.17%
Site Restoration		3.66%
Total		**100%**
Projected Trust Fund Balance at Shutdown		**2,230,990,206**
Projection at Shutdown - License Termination Portion (Allocation based on TLG Study)		**1,654,709,039**

Turkey Point Nuclear Plant – Unit 4
Florida Power and Light Company (FPL),
Decommissioning Funding Status Report

1. **The minimum decommissioning fund estimate pursuant to 10 CFR 50.75(b) and (c).**

Plant Owner (% Ownership)	NRC Minimum (a)
FPL (100%)	481,568,240

(a) Refer to Turkey Point Unit 4 for calculation assumptions

2. **The amount accumulated at the end of the calendar year preceding the date of the report. (Trust fund balance is net of taxes)**

	Total[22]
FPL (100%)	**1,352,251,030**

3. **Projected Funds at Shutdown (2% real rate of return).**

	Total
FPL (100%) (see note (b))	2,563,347,739

(b) Pursuant to Florida Public Service Commission (FPSC) Order No. PSC-16-0250-PAA-EI, customer contributions to the decommissioning trust remain at zero effective June 29, 2016.

4. **Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v).** None

5. **Any modifications to a licensee's method of providing financial assurance occurring since the last submitted report.** None

6. **Any material changes to trust agreements.** None

[22] NRC letter dated November 26, 2008, St. Lucie Plant, Unit Nos. 1 and 2 – Biennial Decommissioning Funding Report (TAC Nos. MD9354 and MD9355), directed FPL to report all funds within the trust as designated for radiological decommissioning purposes since FPL does not earmark each cost component of decommissioning within the trust. However, the trust includes non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the Florida Public Service Commission (FPSC). FPL understands that under NRC guidance, either an order of the FPSC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, Turkey Point Unit 4, allocates the trust account amounts by license termination, spent fuel management and site restoration costs based on assumptions from the decommissioning cost study filed in December 2020 with the FPSC.

TURKEY POINT NUCLEAR PLANT - UNIT 4
NRC Minimum Decommissioning Cost Determination

NRC Minimum = $98.27 million X (0.65L + 0.13E + 0.22B)

Where:

$98.27 million is value for reference PWR in 1986 dollars

L = Labor escalation factor to current year[24]

E = Energy escalation factor to current year[25]

B = LLRW escalation factor to current year[26]

#	Item Description	Value
1	Labor escalation factor for Quarter 4, 2020 [17]	139.3
2	Base adjustment factor from NUREG-1307 [16]	1.98
3	Escalation factor from NUREG-1307	100
4	L = #1 times #2 divided by #3	2.76
5	Electric power escalation factor, 2020 [27]	232.7
6	Electric power escalation factor for Jan., 1986 from NUREG-1307	114.2
7	Fuel escalation factor for 2020 [28]	209.8
8	Fuel escalation factor for Jan., 1986 from NUREG-1307	82
9	P = #5 divided by #6	2.04
10	F = #7 divided by #8	2.56
11	E = 0.58P(#9) + 0.42F(#10) per NUREG-1307	2.26
12	Value of B from Table 2.1 of NUREG-1307 [19]	12.793
13	0.65L(#4) + 0.13E(#11) + 0.22B(#12)	4.90
14	1986 minimum-millions of dollars for PWR	98.27
15	2020 minimum-millions of dollars: #13 times #14	481.57

[23] NUREG 1307, Rev 17, Table 3.2

[24] NUREG 1307 specified that source is Bureau of Labor Statistics Data, Employment Cost Index, Series CIU2010000000220I (South Region).

[25] NUREG 1307 specifies that source is a weighted calculation using Bureau of Labor Statistics Data, Producer Price Index-Commodities, Series wpu0573 (light fuel oils) and wpu0543 (industrial electric power).

[26] NUREG 1307 provides a value for B in Table 2.1.

[27] December 2020 value is 232.7. (See note #18) Information was preliminary as of 01/31/21.

[28] December 2020 value is 209.8 (See note #18) Information was preliminary as of 01/31/21.

TURKEY POINT NUCLEAR PLANT - UNIT 4

The Turkey Point Unit 4 trust includes non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the Florida Public Service Commission (FPSC). FPL understands that under NRC guidance, either an order of the FPSC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, the data summarized below allocates the NRC license termination portion of the trust fund balance based upon percentages in FPL's most recent FPSC decommissioning cost study. Turkey Point Unit 4 is utilizing the formula method to demonstrate financial assurance pursuant to 10CFR 50.75(b).

Florida Power and Light Company		
Decommissioning Trust Fund - License Termination Funds		
As of December 31, 2020		
Energy Solutions Cost Study (thousands of $2020)		**Turkey Point Unit 4**
License Termination		534,293
Spent Fuel Management		138,245
Site Restoration		36,009
Total		**708,547**
Category %		
License Termination		75.41%
Spent Fuel Management		19.51%
Site Restoration		5.08%
Total		**100%**
Projected Trust Fund Balance at Shutdown		**2,563,347,739**
Projection at Shutdown - License Termination Portion (Allocation based on TLG Study)		**1,932,939,880**

Seabrook Station
NextEra Energy Seabrook, LLC,
Hudson Light and Power Department,
Massachusetts Municipal Wholesale Electric Company,
Taunton Municipal Lighting Plant
Decommissioning Funding Status Report[29]

1. **The minimum decommissioning fund estimate pursuant to 10 CFR 50.75(b) and (c).**

Plant Owner (% Ownership)	NRC Minimum (a)
NextEra Energy Seabrook, LLC. (88.22889%)	475,207,860
Hudson Light and Power Department (.07737%)	416,721
Massachusetts Municipal Wholesale Electric Company (11.5934%)	62,442,980
Taunton Municipal Lighting Plant (.10034%)	540,439
Total	**538,608,000**

(a) Refer to Seabrook for calculation assumptions

2. **The amount accumulated at the end of the calendar year preceding the date of the report. (Trust fund balances are net of taxes)**

	Total[30]
NextEra Energy Seabrook, LLC. (88.22889%)	881,700,874
Hudson Light and Power Department (.07737%)	712,161
Massachusetts Municipal Wholesale Electric Company (11.5934%)	83,317,109
Taunton Municipal Lighting Plant (.10034%)	911,063
Total	966,641,206

3. **Projected Funds at Shutdown (2% real rate of return).**

	Total
NextEra Energy Seabrook, LLC. (88.22889%)	**1,689,575,779**
Hudson Light and Power Department (.07737%)	**1,364,691**
Massachusetts Municipal Wholesale Electric Company (11.5934%)	**159,657,966**
Taunton Municipal Lighting Plant (.10034%)	**1,745,841**
Total	**1,852,344,277**

[29] The New Hampshire Nuclear Decommissioning Financing Committee (NDFC) was established under New Hampshire law to provide assurance of adequate funding for decommissioning of nuclear generating facilities. This was intended "to ensure proper and safe decommissioning and subsequent surveillance of nuclear reactor sites to the extent necessary to prevent such sites from constituting a hazard to future generations." RSA 162-F:1. The NDFC is responsible for determining the appropriate amount of money that needs to be set aside and maintained in a trust fund, for the purpose of decommissioning any nuclear facilities located in the state of New Hampshire.

[30] NRC letter dated November 26, 2008, St. Lucie Plant, Unit Nos. 1 and 2 – Biennial Decommissioning Funding Report (TAC Nos. MD9354 and MD9355), directed FPL to report all funds within the trust as designated for radiological decommissioning purposes since FPL does not earmark each cost component of decommissioning within the trust. The Seabrook trusts contain non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the NDFC. NextEra understands that under NRC guidance, either an order of the NDFC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, Seabrook allocates the trust account amounts by license termination, spent fuel management and site restoration costs based on assumptions from the decommissioning cost study filed in 2019 with the NDFC.

4.	**Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v).**	None
5.	**Any modifications to a licensee's method of providing financial assurance occurring since the last submitted report.**	None
6.	**Any material changes to trust agreements.**	None

SEABROOK STATION
NRC Minimum Decommissioning Cost Determination

NRC Minimum = $105 million X (0.65L + 0.13E + 0.22B)

Where:

$105 million is value for reference PWR in 1986 dollars

L = Labor escalation factor to current year[32]

E = Energy escalation factor to current year[33]

B = LLRW escalation factor to current year[34]

#	Item Description	Value
1	Labor escalation factor for Quarter 4, 2020 [17]	144.0
2	Base adjustment factor from NUREG-1307 [16]	2.16
3	Escalation factor from NUREG-1307	100
4	L = #1 times #2 divided by #3	3.11
5	Electric power escalation factor, 2020 [35]	232.7
6	Electric power escalation factor for Jan., 1986 from NUREG-1307	114.2
7	Fuel escalation factor for 2020 [36]	209.8
8	Fuel escalation factor for Jan., 1986 from NUREG-1307	82
9	P = #5 divided by #6	2.04
10	F = #7 divided by #8	2.56
11	E = 0.58P(#9) + 0.42F(#10) per NUREG-1307	2.26
12	Value of B from Table 2.1 of NUREG-1307 [19]	12.793
13	0.65L(#4) + 0.13E(#11) + 0.22B(#12)	5.13
14	1986 minimum-millions of dollars for PWR	105
15	2020 minimum-millions of dollars: #13 times #14	538.61

[31] NUREG 1307, Rev 17, Table 3.2

[32] NUREG 1307 specified that source is Bureau of Labor Statistics Data, Employment Cost Index, and Series CIU2010000000210I (Northeast Region).

[33] NUREG 1307 specifies that source is a weighted calculation using Bureau of Labor Statistics Data, Producer Price Index-Commodities, Series wpu0573 (light fuel oils) and wpu0543 (industrial electric power).

[34] NUREG 1307 provides a value for B in Table 2.1.

[35] December 2020 value is 232.7. (See note #18) Information was preliminary as of 01/31/21.

[36] December 2018 value is 209.8 (See note #18) Information was preliminary as of 01/31/21.

SEABROOK STATION

The Seabrook trusts contain non-earmarked funds for spent fuel management and site restoration purposes collected at the direction of the New Hampshire Decommissioning Financing Committee (NDFC). NextEra understands that under NRC guidance, either an order of the NDFC or an NRC exemption would be necessary to utilize the funds for these non-radiological purposes. For informational purposes only, the data summarized below allocates the trust account amounts by license termination, spent fuel management and site restoration costs based on assumptions from the decommissioning cost study filed in 2019 with the NDFC. Seabrook is utilizing the formula method to demonstrate financial assurance pursuant to 10CFR 50.75(b).

TLG Cost Study Scenario 1 (thousands of $2019)	Seabrook	NextEra	Hudson	MMWEC	Taunton
License Termination	666,537				
Spent Fuel Management	364,661				
Site Restoration	44,673				
Total	1,075,871				
Component %					
License Termination	61.95%				
Spent Fuel Management	33.89%				
Site Restoration	4.15%				
Total	100%				
Projected Trust Fund Balance at Shutdown	1,852,344,277	1,689,575,779	1,364,691	159,657,966	1,745,841
Projection at Shutdown - License Termination Portion (Allocation based on TLG Study)	1,147,587,394	1,046,747,027	845,470	98,913,292	1,081,605

Point Beach Nuclear Plant – Unit 1
NextEra Energy Point Beach, LLC (NextEra),
Decommissioning Funding Status Report

1. **The minimum decommissioning fund estimate pursuant to 10 CFR 50.75(b) and (c).**

	NRC Minimum (a)
NextEra (100%)	453,146,256

(a) Refer to Point Beach Unit 1 for calculation assumptions.

2. **The amount accumulated at the end of the calendar year preceding the date of the report. (Trust fund balance is net of taxes)**

	Total
NextEra (100%)	527,719,591

3. **Projected Funds at Shutdown (2% real rate of return).**

	Total
NextEra (100%) (see note (b))	687,931,263

(b) Projection includes a pro-rata credit during the dismantlement period pursuant to 10CFR 50.75(e)(1)(ii).

4. **Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v).** None

5. **Any modifications to a licensee's method of providing financial assurance occurring since the last submitted report.** None

6. **Any material changes to trust agreements.** None

POINT BEACH NUCLEAR PLANT - UNIT 1
NRC Minimum Decommissioning Cost Determination

NRC Minimum = $90.84 million X (0.65L + 0.13E + 0.22B)

Where:

$90.84 million is value for reference PWR in 1986 dollars

L = Labor escalation factor to current year[38]

E = Energy escalation factor to current year[39]

B = LLRW escalation factor to current year[40]

#	Item Description	Value
1	Labor escalation factor for Quarter 4, 2020 [17]	139.1
2	Base adjustment factor from NUREG-1307 [16]	2.08
3	Escalation factor from NUREG-1307	100
4	L = #1 times #2 divided by #3	2.89
5	Electric power escalation factor, 2020 [41]	232.7
6	Electric power escalation factor for Jan., 1986 from NUREG-1307	114.2
7	Fuel escalation factor for 2020 [42]	209.8
8	Fuel escalation factor for Jan., 1986 from NUREG-1307	82
9	P = #5 divided by #6	2.04
10	F = #7 divided by #8	2.56
11	E = 0.58P(#9) + 0.42F(#10) per NUREG-1307	2.26
12	Value of B from Table 2.1 of NUREG-1307 [19]	12.793
13	0.65L(#4) + 0.13E(#11) + 0.22B(#12)	4.99
14	1986 minimum-millions of dollars for PWR	90.84
15	2020 minimum-millions of dollars: #13 times #14	453.15

[37] NUREG 1307, Rev 17, Table 3.2

[38] NUREG 1307 specified that source is Bureau of Labor Statistics Data, Employment Cost Index, Series CIU2010000000230I (Midwest Region).

[39] NUREG 1307 specifies that source is a weighted calculation using Bureau of Labor Statistics Data, Producer Price Index-Commodities, Series wpu0573 (light fuel oils) and wpu0543 (industrial electric power).

[40] NUREG 1307 provides a value for B in Table 2.1.

[41] December 2020 value is 232.7 (See note #18) Information was preliminary as of 01/31/21.

[42] December 2020 value is 209.8 (See note #18) Information was preliminary as of 01/31/21.

Point Beach Nuclear Plant – Unit 2
NextEra Energy Point Beach, LLC (NextEra),
Decommissioning Funding Status Report

1. **The minimum decommissioning fund estimate pursuant to 10 CFR 50.75(b) and (c).**

	NRC Minimum (a)
NextEra (100%)	453,146,256

(a) Refer to Point Beach Unit 2 for calculation assumptions.

2. **The amount accumulated at the end of the calendar year preceding the date of the report. (Trust fund balance is net of taxes)**

	Total
NextEra (100%)	496,953,619

3. **Projected Funds at Shutdown (2% real rate of return).**

	Total
NextEra (100%) (see note (b))	679,504,516

(b) Projection includes a pro-rata credit during the dismantlement period pursuant to 10CFR 50.75(e)(1)(ii).

4. **Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v).** None

5. **Any modifications to a licensee's method of providing financial assurance occurring since the last submitted report.** None

6. **Any material changes to trust agreements.** None

POINT BEACH NUCLEAR PLANT - UNIT 2
NRC Minimum Decommissioning Cost Determination

NRC Minimum = $90.84 million X (0.65L + 0.13E + 0.22B)

Where:

$90.84 million is value for reference PWR in 1986 dollars

L = Labor escalation factor to current year[44]

E = Energy escalation factor to current year[45]

B = LLRW escalation factor to current year[46]

#	Item Description	Value
1	Labor escalation factor for Quarter 4, 2020 [17]	139.1
2	Base adjustment factor from NUREG-1307 [16]	2.08
3	Escalation factor from NUREG-1307	100
4	L = #1 times #2 divided by #3	2.89
5	Electric power escalation factor, 2020 [47]	232.7
6	Electric power escalation factor for Jan., 1986 from NUREG-1307	114.2
7	Fuel escalation factor for 2020 [48]	209.8
8	Fuel escalation factor for Jan., 1986 from NUREG-1307	82
9	P = #5 divided by #6	2.04
10	F = #7 divided by #8	2.56
11	E = 0.58P(#9) + 0.42F(#10) per NUREG-1307	2.26
12	Value of B from Table 2.1 of NUREG-1307 [19]	12.793
13	0.65L(#4) + 0.13E(#11) + 0.22B(#12)	4.99
14	1986 minimum-millions of dollars for PWR	90.84
15	2020 minimum-millions of dollars: #13 times #14	453.15

[43] NUREG 1307, Rev 17, Table 3.2

[44] NUREG 1307 specified that source is Bureau of Labor Statistics Data, Employment Cost Index, Series CIU2010000000230I (Midwest Region).

[45] NUREG 1307 specifies that source is a weighted calculation using Bureau of Labor Statistics Data, Producer Price Index-Commodities, Series wpu0573 (light fuel oils) and wpu0543 (industrial electric power).

[46] NUREG 1307 provides a value for B in Table 2.1.

[47] December 2020 value is 232 7. (See note #18) Information was preliminary as of 01/31/21.

[48] December 2020 value is 209.8 (See note #18) Information was preliminary as of 01/31/21.

Enclosure 2

Independent Spent Fuel Storage Installation (ISFSI)
Decommissioning Financial Assurance Update
10 CFR 72.30(c)

ISFSI Decommissioning Financial Assurance Update
10 CFR 72.30(c)

Point Beach site-specific ISFSI decommissioning cost estimate was submitted with the Decommissioning Funding Status Reports dated March 30, 2017. The site-specific studies remain valid for technological and status changes, but have been escalated to account for inflation. The following table adjusts the current ISFSI Decommissioning Funding Plans to 2020 dollars. ISFSI cost estimates for Seabrook, St. Lucie and Turkey Point are attached.

Site	Trust Balance as of 12/31/20 ($Thousands)	Projected 10 CFR 50.75 Decommissioning Trust Fund Value ($Thousands)	NRC Minimum Amount per 10 CFR 50.75(b) ($Thousands)	Decommissioning Trust Fund Value Surplus ($Thousands)	ISFSI Decommissioning Cost Estimate ($Thousands)
St. Lucie Unit 1	1,464,702	1,978,152	497,783	1,480,369	1,049
St. Lucie Unit 2 - FPL	1,259,140	1,957,300	423,636	1,533,664	1,339
St. Lucie Unit 2 - FMPA	95,074	147,791	43,835	103,956	139
St. Lucie Unit 2 - OUC	47,076	73,179	30,313	42,866	96
Turkey Point Unit 3	1,193,965	2,230,990	481,568	1,749,422	1,054
Turkey Point Unit 4	1,352,251	2,563,348	481,568	2,081,779	1,582
Seabrook - NextEra	881,701	1,689,576	475,208	1,214,368	7,228
Seabrook - MMWEC	83,317	159,658	62,443	97,215	950
Seabrook - Taunton	911	1,746	540	1,205	8
Seabrook - Hudson	712	1,365	417	948	6
Point Beach Unit 1	527,720	687,931	453,146	234,785	4,366
Point Beach Unit 2	496,954	679,505	453,146	226,358	4,366

The following table supplements the existing Point Beach decommissioning funding plan to address new information that may affect the previously submitted reports in accordance with 10 CFR 72.30(c)(1-4).

Point Beach (NextEra Energy Point Beach, LLC)

Spills of radioactive material producing additional residual radioactivity in onsite subsurface material	None
Facility modifications	None
Changes in authorized possession limits	None
Actual remediation costs that exceed previous cost estimate	None

ATTACHMENT 1

Florida Power & Light Company
St. Lucie Units 1 and 2

ENERGYSOLUTIONS

Document No. 164086-ISFSI

2020 Decommissioning Cost Update of the St. Lucie Independent Spent Fuel Storage Installation

Project No. 164086 **Rev. 0**

Prepared for:
Florida Power & Light Company

Prepared by:
Energy*Solutions*, LLC
121 W. Trade Street, Suite 2700
Charlotte, NC 28202

Authored By: _____ 01/20/2021
Kevin M. Kirkley, Sr. Estimator Date

Reviewed By: _____ 01/20/2021
Jake H. Oleksiak, Project Controls Manager Date

- [X] New Report
- [ ] Title Change
- [ ] Report Revision
- [ ] Report Rewrite

Effective Date: 01/20/2021

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Acronyms and Abbreviations

AIF	Atomic Industrial Forum
ALARA	As Low As Reasonably Achievable
BWR	Boiling Water Reactor
CFR	Code of Federal Regulations
CWS	Circulating Water System
DAW	Dry Active Waste
DCE	Decommissioning Cost Estimate
DGC	Decommissioning General Contractor
DOE	U.S. Department of Energy
DSC	Dry Storage Canister
EPRI	Electric Power Research Institute
ES	EnergySolutions
FEMA	Federal Emergency Management Agency
FPL	Florida Power & Light Company
FSS	Final Status Survey
GSA	U.S. General Services Administration
GTCC	Greater Than Class C
HP	Health Physics
HSM	Horizontal Storage Module
INPO	Institute of Nuclear Power Operations
ISFSI	Independent Spent Fuel Storage Installation
LLRW	Low-Level Radioactive Waste
LOP	Life-of-Plant
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MWt	Megawatt thermal
St. Lucie	St. Lucie Nuclear Plant
NRC	Nuclear Regulatory Commission
ORISE	Oak Ridge Institute for Science and Education
PCB	Polychlorinated Biphenyl
PSDAR	Post-Shutdown Decommissioning Activities Report
PWR	Pressurized Water Reactor
WBS	Work Breakdown Structure
WCS	Waste Control Specialists LLC
UCF	Unit Cost Factor

1.0 EXECUTIVE SUMMARY

This report presents the 2020 Decommissioning Cost Estimate (DCE) Study of the St. Lucie Nuclear Plant, Independent Spent Fuel Storage Installation (Ref. No 1). The St. Lucie Nuclear Plant (St. Lucie) is owned and operated by Florida Power & Light Company (FPL).

This report has been performed to furnish an estimate, for financial planning purposes, of the costs for the Independent Spent Fuel Storage Installation (ISFSI) decommissioning pursuant to 10 CFR 72.30 (Ref. No. 2).

On June 17, 2011, the NRC published a final rule amending its regulations to improve decommissioning planning. The rule became effective on December 17, 2012. This rule requires licensees under Part 72 to plan for ISFSI decommissioning. The rule includes, under 10 CFR Part 72.30, the preparation and reporting of decommissioning cost estimates for ISFSIs. NRC guidance for ISFSI decommissioning cost estimates is contained in NUREG-1757, "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness." (Ref. No. 3)

NUREG-1757 does not apply to licensees under 10 CFR Part 50 (Ref. No. 4) nor does it eliminate the need to follow Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," (Ref. No. 5) or NUREG-1713 (Ref No. 6). It does provide additional information to support the development of cost estimates for ISFSI decommissioning. This estimate was prepared in accordance with the guidelines provided in Regulatory Guide 1.202 and NUREG-1713. In addition, it does take into account the guidelines identified in NUREG-1757.

The study methodology follows the basic approach originally presented in the Atomic Industrial Forum/National Environmental Studies Project Report AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Ref. No. 7). The estimate is based on compliance with current regulatory requirements and proven decommissioning technologies.

This study reports the cost for decommissioning the St. Lucie ISFSI as a separate sub-project within the overall site-wide decommissioning, spent fuel management and site restoration programs implemented following shutdown. These sub-project costs occur during and after the completion of the removal of all spent fuel.

This study reports the ISFSI decommissioning costs for the following two scenarios defined by FPL:

Scenario 1 – Unit 1 SAFSTOR, DECON both following Unit 2 Shutdown

- SAFSTOR Unit 1 when it is permanently shutdown in 2036
- DOE starts accepting fuel from the site in 2033
- Unit 1 transfers spent fuel from pool to DOE prior to shutdown beginning in 2033
- Unit 1 Fuel pool empty by 2046
- DECON methodology for Units 1 and 2 after Unit 2 is permanently shutdown in 2043
- Unit 2 transfers spent fuel from pool to DOE prior to shutdown beginning in 2034
- Unit 2 Fuel pool empty by 2046
- All Dry Fuel transferred from ISFSI to DOE by 2071
- Decommissioning will be performed by FPL and a Decommissioning General Contractor (DGC)

The ISFSI decommissioning cost estimate results are provided in 2020 dollars in Table 1-1.

Table 1-1

Florida Power and Light - St. Lucie ISFSI Cost Summary (thousands of 2020 dollars)	
Scenario	Total
1 - Decon	2,621

Table 1-2 provides the distribution of costs between Units 1 and 2.

Table 1-2

Florida Power and Light - St. Lucie ISFISI Cost Summary (thousands of 2020 dollars)			
Scenario	Unit 1	Unit 2	Total
1 - Decon	1,049	1,573	2,621

The estimate inventories are based on the size of the ISFSI required to provide post-shutdown dry storage of spent fuel and the supporting infrastructure. These inventories, Energy*Solutions*' (ES) proprietary Unit Cost Factors (UCFs), historical data and execution strategy were used to generate required manhours, waste volumes and classification, and estimated costs. A detailed project estimate is included in Appendix A.

The schedule reflects Energy*Solutions*' historical execution strategy and experience to sequence activity-dependent or distributed decommissioning elements such as planning and preparations, major component removal, building decontamination, building demolition, etc. The schedule is summarized in Table 1-3 below.

Table 1-3 below provides a schedule summary for a Prompt DECON scenario with Unit 1 Shutdown in 2036 and Unit 2 Shutdown in 2043.

Table 1-3

FPL DCE-01 St. Lucie Units 1 and 2 Scenario 1 Schedule Summary	
Year	**Item**
2033	DOE starts accepting fuel from spent fuel pool
2036	Unit 1 Shutdown
2040	Unit 1 SAFSTOR period begins
2043	Unit 2 Shutdown
2046	Unit 1 Fuel Pool Empty
2046	Unit 2 Fuel Pool Empty
2046	Unit 1 SAFSTOR period ends
2047	Start Demolition
2053	Decommissioning and Site Restoration Complete
2071	ISFSI Empty
2073	ISFSI Decommissioning and Site Restoration Complete

2.0 INTRODUCTION

2.1 Study Objective

This report presents a 2020 update of the 2015 Decommissioning Cost Study of the St. Lucie Independent Spent Fuel Storage Installation (Ref. No. 1), hereinafter referred to as the 2015 ISFSI Cost Study. The St. Lucie Nuclear Plant (St. Lucie) is owned and operated by FPL

This report has been performed to furnish an estimate, for financial planning purposes, of the costs for the Independent Spent Fuel Storage Installation (ISFSI) decommissioning pursuant to 10 CFR 72.30 (Ref. No. 2).

On June 17, 2011, the NRC published a final rule amending its regulations to improve decommissioning planning. The rule became effective on December 17, 2012. This rule requires licensees under Part 72 to plan for ISFSI decommissioning. The rule includes, under 10 CFR Part 72.30, the preparation and reporting of decommissioning cost estimates for ISFSIs. NRC guidance for ISFSI decommissioning cost estimates is contained in NUREG-1757, "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness." (Ref. No. 3)

NUREG-1757 does not apply to licensees under 10 CFR Part 50 (Ref. No. 4) nor does it eliminate the need to follow Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," (Ref. No. 5) or NUREG-1713 (Ref No. 6). It does provide additional information to support the development of cost estimates for ISFSI decommissioning. This estimate was prepared in accordance with the guidelines provided in Regulatory Guide 1.202 and NUREG-1713. In addition, it does take into account the guidelines identified in NUREG-1757.

The study methodology follows the basic approach originally presented in the Atomic Industrial Forum/National Environmental Studies Project Report AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Ref. No. 7). The estimate is based on compliance with current regulatory requirements and proven decommissioning technologies.

This study reports the cost for decommissioning the St. Lucie ISFSI as a separate sub-project within the overall site-wide decommissioning, spent fuel management and site restoration programs implemented following shut-down. These sub-project costs occur during and after the completion of the removal of all spent fuel.

2.2 Regulatory Framework

Provisions of current laws and regulations affecting the ISFSI decommissioning and waste management are as follows:

- 10 CFR 72.30(b) requires that a licensee under Part 72 must submit a decommissioning funding plan that contains a detailed decommissioning cost estimate in an amount reflecting:
    a. The cost of an independent contractor to perform all decommissioning activities.
    b. An adequate contingency factor.
    c. The cost for unrestricted use.

Decommissioning Alternatives

The three basic methods for decommissioning are DECON, SAFSTOR, and ENTOMB, which are summarized as follows:

1. DECON: The equipment, structures, and portions of the facility and site that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the license after cessation of operations.

2. SAFSTOR: The facility is placed in a safe, stable condition and maintained in that state (safe storage). The facility is decontaminated and dismantled at the end of the storage period to levels that permit license termination. NRC regulations require decommissioning to be completed within 60 years of cessation of operation. Durations less than the regulatory-allowed maximum may be referred to as Modified SAFSTOR.

3. ENTOMB: Radioactive structures, systems, and components are encased in a structurally long-lived substance, such as concrete. The entombed structure is appropriately maintained and monitored until radioactivity decays to a level that permits termination of the license. Since entombment will exceed the requirement for decommissioning to be completed within 60 years of cessation of operation, NRC handles entombment requests on a case-by-case basis.

The ISFSI will be decommissioned as soon as is practical after the removal of all spent fuel.

3.0 STUDY METHODOLOGY

3.1 General Description

Energy*Solutions* maintains a proprietary decommissioning cost model based upon the fundamental technical approach established in AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," dated May 1986 (Ref. No. 7). The cost model has been continuously updated in accordance with regulatory requirements, Energy*Solutions*' actual project experience, and the latest industry technologies. The cost model includes elements for estimating distributed (direct costs) and undistributed costs. Distributed costs are activity specific and include planning and preparation costs as well as the decontamination, packaging, disposal, and removal of major components and systems. Undistributed costs, sometimes referred to as collateral costs, are typically time-dependent costs such as utility and decommissioning general contractor staff, property taxes, insurance, regulatory fees and permits, energy costs, and security staff.

The methodology for preparing cost estimates for a selected decommissioning alternative requires development of a site-specific detailed work activity sequence based upon the plant inventory. The activity sequence is used to define the labor, material, equipment, energy resources, and duration required for each activity. In the case of major components, individual work sequence activity analyses are performed based on the physical and radiological characteristics of the component and the packaging, transportation, and disposal options available.

In the case of structures and small components and equipment such as piping, pumps, and tanks, the work durations and costs are calculated based on Unit Cost Factors (UCFs). UCFs are economic parameters developed to express costs per unit of work output, piece of equipment, or time. They are developed using decommissioning experience, information on the latest technology applicable to decommissioning, and engineering judgment. The total cost of a specific decommissioning activity can be determined by multiplying the total number of units associated with that activity by the UCF, expressed as $/unit, for that activity. For example, the estimated demolition cost of a non-contaminated concrete structure can be obtained by multiplying the volume of concrete in the structure by the UCF for non-contaminated reinforced concrete demolition, expressed in $/unit volume. Each UCF has associated with it a man-hours/unit and schedule-hours/unit. From these values, total man-hours and total schedule-hours can be determined for a particular activity.

3.2 Schedule Analysis

Energy*Solutions* has established a Work Breakdown Structure (WBS) that typically defines decommissioning costs and the schedule into six primary periods to define the scope of work. Those periods are:

- Period 1 – Shutdown and Transition
- Period 2 – SAFSTOR
- Period 3 – Decommissioning and License Termination
- Period 4 – Site Restoration
- Period 5 – Dry Fuel / GTCC Storage and Transfer
- Period 6 – ISFSI Decommissioning

The work is broken down further into sub-periods as defined in Section 4.2 below.
Once the work activity durations are established, a time-phased schedule and cash-flow analysis are performed using Energy*Solutions*' InEight estimating and scheduling tools to generate annual spending.

The schedule accounts for constraints such as spent fuel cooling periods and regulatory reviews. The schedule is typically delineated into periods that differentiate manpower requirements and undistributed costs.

3.3 Decommissioning Staff

Energy*Solutions*' philosophy towards decommissioning is to assume that the project will be performed in an efficiently planned and executed manner using project personnel experienced in decommissioning. These ISFSI D&D scenarios assume that the decommissioning will be performed by an experienced and qualified DGC. It is also assumed that the utility staff will be supplemented by professional consulting engineering, particularly in the planning and preparation phase.

Staffing levels for each project period are based on the Atomic Industrial Forum (AIF) guidelines, Energy*Solutions*' project experience and industry practice. The sizes of the staffs are varied in each period in accordance with the requirements of the work activities. Staffing has been organized into the following departments or functional groups:

- Administration
- Engineering
- Health Physics
- Radiation Protection
- Management
- Maintenance and Operations
- Quality Assurance
- Security Administration
- Security Guard Force
- Waste Operations
- DGC Staff

3.4 Waste Disposal

No radioactive waste is anticipated to be generated during the decommissioning of the ISFSI.

Non-Radioactive Non-Hazardous Waste Disposal

Energy*Solutions* assumes that recyclable, non-radioactive scrap metal resulting from the decommissioning program will be transported to a scrap metal dealer. However, no credit is assumed in the estimate for the value of the scrap metal. Concrete debris is assumed to be processed by size reduction, with removal of structural reinforcing steel, and used on site as engineered fill for voids. Asphalt from parking lots and roadways is assumed to be stockpiled on site and removed, at no cost to the project, by a recycler. All other demolition debris is removed from the site and disposed of at a local construction debris landfill.

Hazardous and Industrial Waste Disposal

Uncontaminated lead shielding remaining after shutdown was assumed to be removed from its installed locations and shipped offsite by entities having a need for the material. The entities receive the lead at no charge in return for providing the removal and shipping services. Non-Radioactive contaminated surfaces coated with lead-based paint will be removed as non-hazardous building demolition debris. All other

chemicals and hazardous materials present at shutdown are assumed to be removed and disposed of by the plant staff prior to decommissioning as a normal part of plant operations.

3.5 Final Status Survey

The cost of performing a final status survey (FSS) is based on NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)" (Ref. No. 8). Estimates of MARSSIM Class I, II and III survey designations are based on radiological characterization data furnished by FPL and assumptions regarding contamination resulting from small and large component removal activities. The FSS activity cost calculation includes the in-place remote survey of underground metal and concrete pipe, soil, and groundwater sampling and analysis. Estimated costs for NRC and Oak Ridge Institute for Science and Education (ORISE) verification are also included, and the NRC review period is incorporated into the project schedule.

3.6 Contingency

Contingencies are applied to cost estimates primarily to allow for unknown or unplanned occurrences during the actual program, e.g. increased radioactive contamination over that expected, equipment breakdowns, weather delays, and labor strikes. This is consistent with the definition provided in the DOE Cost Estimating Guide, DOE G 430.1-1, March 1997 (DOE G) (Ref. No. 9): Contingency "covers costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties within the defined project scope. The amount of contingency will depend on the status of design, procurement, and construction; and the complexity and uncertainties of the component parts of the project. Contingency is not to be used to avoid making an accurate assessment of expected costs."

NUREG-1757 recommends a contingency of 25%, which is consistent with the analysis and guidance contained in NUREG/CR-6477. However, based on previous experience of projects completed and proposals submitted Energy*Solutions* has included a 15% contingency in this ISFSI Decommissioning Cost Estimate.

3.7 Cost Reporting

Total project costs are aggregated from the distributed activities (direct costs) and undistributed costs into the following categories:

- Labor
- Materials and Equipment
- Waste Transportation and Disposal
- Other Direct Costs

Other costs include property taxes, insurance, license fees, permits, and energy. Waste disposal costs are the summation of packaging, transportation, base disposal rate, and any applicable surcharges. Health physics (HP) supplies and small tool costs are calculated as a component of each distributed activity cost and included in the category of Material and Equipment, with the exception that HP supplies for utility staff are calculated and reported as an undistributed line item. A contingency is then applied to each activity.

4.0 SITE SPECIFIC TECHNICAL APPROACH

4.1 Facility Description

The St. Lucie Nuclear Plant is a nuclear-powered electrical generating facility consisting of two PWRs. St. Lucie is located on Hutchinson Island, midway between the Florida cities of Fort Pierce and Stuart. The plant site comprises approximately 1,132 acres, and approximately one quarter of the site is used for generating electricity.

Both Unit 1 and Unit 2 are two-loop Combustion Engineering PWRs with a current thermal output of 3,020 MWt and a design electrical rating of 1,062 MWe and 1,074 MWe, respectively. The current license expiration dates for Units 1 and 2 are in 2036 and 2043, respectively.

St. Lucie has an existing ISFSI supporting Units 1 and 2. The ISFSI is operated under the 10 CFR Part 72 general license using the manufacturer's Certificate of Compliance.

4.2 Decommissioning Periods

Energy*Solutions* has established a Work Breakdown Structure (WBS) that typically defines decommissioning cost estimates with six primary periods to define the scope of work. Those periods are:

- Period 1 – Shutdown and Transition
- Period 2 – SAFSTOR
- Period 3 – Decommissioning and License Termination
- Period 4 – Site Restoration
- Period 5 – Dry Fuel / GTCC Storage and Transfer
- Period 6 – ISFSI Decommissioning

The work is broken down further into sub-periods.

For this site-specific cost study, all of the ISFSI decommissioning work will be performed during Period 6 and a summary of activities performed for both scenarios are as follows:

Period 6 – ISFSI Decommissioning

ISFSI D&D Planning and Preparations

- Prepare, Submit and NRC Review of License Termination Plan

ISFSI Final Status Surveys

- Verification Surveys
- Prepare, Submit and NRC Review of Final Report on ISFSI Decommissioning

Undistributed Costs for ISFSI Decommissioning

- General Contractor Staff

4.3 Decommissioning Staff

Energy*Solutions* developed staffing based on the assumption that decommissioning will be performed by an experienced and qualified Decommissioning General Contractor, with oversight, management and security of the decommissioning operations performed by the utility staff. It is also assumed that the utility staff will be supplemented by professional consulting engineering, particularly in the planning and preparation phase. The sizes of the staffs are varied in each period in accordance with the requirements of the work activities.

5.0 BASES OF ESTIMATE AND KEY ASSUMPTIONS

The bases of, and key assumptions for, this site-specific decommissioning estimate are presented below:

1. All cost data used in this study are in 2020 dollars.
2. Total and subtotal amounts are rounded.
3. Energy*Solutions* developed project schedules based on Unit 1 and Unit 2 shutdown dates of 2036 and 2043, respectively, and fuel shipping schedules provided by FPL.
4. The decommissioning will be performed using currently available technologies.
5. The estimate is based on the site and scenario specific ISFSI configuration.
6. All transformers on site following shutdown are assumed to be polychlorinated biphenyl (PCB)-free, therefore, this estimate does not include costs for disposition of PCB contaminated transformers.
7. Cost for transportation of clean scrap metal to a recycler is included in the estimate; however, no credit is taken for the value of the scrap metal. All other concrete and demolition debris are removed from the site and disposed of at a local off-site construction landfill.
8. The estimate is based on final site restoration, in which all existing and proposed structures, with the exception of the switchyard, will be removed. Clean demolition costs assume that all site improvements will be removed in their entirety.
9. St. Lucie currently has an existing ISFSI on site. The ISFSI is operated under the 10 CFR Part 72 general license using the manufacturer's Certificate of Compliance. Construction costs for any expansion of the ISFSI required for additional storage has not been included, but demolition has been included in the estimate.
10. The ISFSI pad and fuel modules are assumed to have no activated concrete or surface contamination; therefore, no radiological decommissioning is assumed to be required. As a sub-project, the ISFSI D&D estimate is limited to (a) the preparation of a license termination plan, and (b) the planning and performance of a Final Status Survey conducted during the ISFSI dismantlement and demolition to verify that NRC release limits are being met. The costs of dismantlement and demolition of the ISFSI are accounted for separately.
11. Energy*Solutions* has included NRC inspection fees during each decommissioning period based on the type and level of activities being performed.
12. Supplies and services costs were calculated based on information provided by FPL and adjusted by Energy*Solutions* to match the requirements of each period, based on staffing levels.
13. Utility staff and security positions, and average direct-burdened salary data were supplied by FPL.
14. DGC staff salaries, including overhead and profit, were determined by using Energy*Solutions*' project experience and standard assumptions for these rates.

15. Certain professional personnel used for the planning and preparation activities, and DGC personnel, that are based in the local economy are assumed to be paid per diem based on area per diem rates from U.S. General Services Administration (GSA).

16. This study has considered the impact of the September 11, 2001 terrorist attack on security force staffing and requirement. The security guard force included in this estimate has been sized accordingly.

17. This study follows the occupational exposure principles of As Low As Reasonably Achievable (ALARA) through the use of productivity loss factors that incorporate such items as the use of respiratory protection and personnel protective clothing. These factors increase the work duration and cost.

18. The costs of all required safety analyses and safety measures for the protection of the general public, the environment, and decommissioning workers are included in the cost estimates. This reflects the requirements of:

10 CFR 20	Standards for Protection Against Radiation
10 CFR 50	Domestic Licensing of Production and Utilization Facilities
10 CFR 61	Licensing Requirements for Land Disposal of Radioactive Waste
10 CFR 71	Packaging of Radioactive Material for Transport
10 CFR 72	Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste
29 CFR 1910	Occupational Safety and Health Standards
49 CFR 170-189	Department of Transportation Regulations Governing the Transport of Hazardous Materials
Reg. Guide 1.159	Assuring the Availability of Funds for Decommissioning Nuclear Reactors

19. Activity labor costs do not include any allowance for delays between activities, nor is there any cost allowance for craft labor retained on site while waiting for work to become available.

6.0 STUDY RESULTS

The study results for each of the ISFSI scenarios are presented in this section.

The cost estimate results are provided in Table 6-1 below. This table provides Independent Spent Fuel Storage Installation (ISFSI) decommissioning costs pursuant to 10 CFR 72.30.

Table 6-1

Florida Power and Light - St. Lucie ISFSI Cost Summary (thousands of 2020 dollars)	
Scenario	Total
1 - Decon	2,621

Summary cost tables are shown for each scenario below. Detailed estimates for each scenario are provided in Appendix A.

6.1 Scenario 1 – Prompt Decon following Unit 2 Shutdown

Cost Summary

Table 6-2 below provides the cost estimate results for Scenario 1 by period and separated into Unit 1, Unit 2 and Total.

Table 6-2

Florida Power and Light - St. Lucie ISFISI Cost Summary by Period & Unit (thousands of 2020 dollars)				
Period	Item Description	Unit 1	Unit 2	Total Cost
Period 6	ISFSI DECOMMISSIONING	1,049	1,573	2,621

Table 6-3 below provides the cost estimate results for Scenario 1 organized by period and separated by cost type.

Table 6-3

Florida Power and Light - St. Lucie ISFISI Cost Summary by Period & Cost Type (thousands of 2020 dollars)							
Period	Item Description	Labor Cost	Materials & Equipment	Waste Transport & Disposal	Other Direct Cost (ODC)	Contingency	Total Cost
Period 6	ISFSI DECOMMISSIONING	2,065	55	-	160	342	2,621

A detailed estimate is provided in Appendix A.

Schedule Summary

Table 6-4 below provides a schedule summary for Scenario 1 based on a DECON scenario with Unit 1 Shutdown 2036 and Unit 2 Shutdown in 2043.

Table 6-4

FPL DCE-01 St. Lucie Units 1 and 2 Scenario 1 Schedule Summary	
Year	**Item**
2033	DOE starts accepting fuel from spent fuel pool
2036	Unit 1 Shutdown
2040	Unit 1 SAFSTOR period begins
2043	Unit 2 Shutdown
2046	Unit 1 Fuel Pool Empty
2046	Unit 2 Fuel Pool Empty
2046	Unit 1 SAFSTOR period ends
2047	Start Demolition
2053	Decommissioning and Site Restoration Complete
2071	ISFSI Empty
2073	ISFSI Decommissioning and Site Restoration Complete

Project Staffing

Table 6-5 below provides project staffing for Scenario 1 organized by period and staff group.

Table 6-5

Period 6 - ISFSI Decommissioning		2071	2072	2073	2074
Utility Staff		-	-	-	-
Project Management			1	0.5	
Engineering			1	0.5	
Health Physics/Rad Protection				0.5	
Administration					
Maintenance & Operations					
Quality Assurance					
Waste Management					
General Contractor Staff		-	**2**	**1.5**	-
Period 6 - ISFSI Decommissioning		-	**2**	**1.5**	-

Waste Disposal Volumes

The ISFSI pad and fuel modules assumed to have no activated concrete or surface contamination.

7.0 REFERENCES

1. Energy*Solutions*, LLC, "2015 Decommissioning Cost Study of the St. Lucie Independent Spent Fuel Storage Installation," Document Number 164005-01-DCE-012, Rev. 0, January 7, 2015.

2. U.S. Nuclear Regulatory Commission, "Domestic Licensing of Production and Utilization Facilities," 10 CFR Part 72, 2008.

3. U.S. Nuclear Regulatory Commission "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness." NUREG – 1757, February, 2012.

4. U.S. Nuclear Regulatory Commission, "Domestic Licensing of Production and Utilization Facilities," 10 CFR Part 50, 2008.

5. U.S. Nuclear Regulatory Commission, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, February 2005.

6. U.S. Nuclear Regulatory Commission, "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors." NUREG 1713, December 2004.

7. Atomic Industrial Forum, Inc., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

8. U.S. Nuclear Regulatory Commission, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," NUREG-1575, Rev. 1, August 2000.

9. U.S. Department of Energy, "Cost Estimating Guide," DOE G 430.1-1, March 1997.

Appendix A

Florida Power and Light
St. Lucie
ISFSI

(thousands of 2020 dollars)

Period	Item Number	Item Description	Labor Cost	Materials & Equipment	Waste Transportation & Disposal	Other Direct Cost (ODC)	Contingency	Total Cost (Estimated)	License Termination	Spent Fuel Management	Site Restoration
Period 1 Total		**SHUTDOWN & TRANSITION**	-	-	-	-	-	-	-	-	-
Period 2 Total		**SAFSTOR**	-	-	-	-	-	-	-	-	-
Period 3 Total		**DECOMMISSIONING & LICENSE TERMINATION**	-	-	-	-	-	-	-	-	-
Period 4 Total		**SITE RESTORATION**	-	-	-	-	-	-	-	-	-
Period 5 Total		**DRY FUEL / GTCC STORAGE & TRANSFER**	-	-	-	-	-	-	-	-	-
	6a.1	Preparation and NRC Review of License Termination Plan	112	-	-	160	41	313	-	313	-
6a Total		**ISFSI D&D Planning & Preparations**	**112**	-	-	**160**	**41**	**313**	-	**313**	-
	6b.1	Clean Demolition of ISFSI						-	-	-	-
	6b.2	Demolition of ISFSI Support Structures						-	-	-	-
6b Total		**ISFSI and Support Structure Clean Demolition**	-	-	-	-	-	-	-	-	-
	6c.1	Verification Surveys	203	55	-	-	39	297	-	297	-
	6c.2	Preparation of Final Report on Decommissioning and NRC Review	112	-	-	-	17	129	-	129	-
6c Total		**ISFSI Final Status Surveys**	**315**	**55**	-	-	**56**	**426**	-	**426**	-
	6d.1	Utility Staff		-	-	-	-	-	-	-	-
	6d.2	Security Guard Force		-	-	-	-	-	-	-	-
	6d.3	General Contractor Staff	1,637	-	-	-	246	1,883	-	1,883	-
	6d.4	Property Taxes	-	-	-		-	-	-	-	-
	6d.5	Insurance	-	-	-		-	-	-	-	-
	6d.6	Energy	-	-	-		-	-	-	-	-
	6d.7	County Fees	-	-	-		-	-	-	-	-
	6d.8	FEMA Fees	-	-	-		-	-	-	-	-
6d Total		**Undistributed Costs for ISFSI Decommissioning**	**1,637**	-	-	-	**246**	**1,883**	-	**1,883**	-
Period 6 Total		**ISFSI DECOMMISSIONING**	**2,065**	**55**	-	**160**	**342**	**2,621**	-	**2,621**	-
GRAND TOTAL			**2,065**	**55**	-	**160**	**342**	**2,621**	-	**2,621**	-

ATTACHMENT 2

Florida Power & Light Company
Turkey Point Units 3 and 4

L-2021-015
Attachment 2 - Turkey Point

ENERGYSOLUTIONS

Document No. 164086-ISFSI

2020 Decommissioning Cost Update of the Turkey Point Independent Spent Fuel Storage Installation

Project No. 164086 **Rev. 0**

Prepared for:
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- [X] New Report
- [ ] Title Change
- [ ] Report Revision
- [ ] Report Rewrite

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Acronyms and Abbreviations

AIF	Atomic Industrial Forum
ALARA	As Low As Reasonably Achievable
BWR	Boiling Water Reactor
CFR	Code of Federal Regulations
CWS	Circulating Water System
DAW	Dry Active Waste
DCE	Decommissioning Cost Estimate
DGC	Decommissioning General Contractor
DOE	U.S. Department of Energy
DSC	Dry Storage Canister
EPRI	Electric Power Research Institute
ES	EnergySolutions
FEMA	Federal Emergency Management Agency
FPL	Florida Power & Light Company
FSS	Final Status Survey
GSA	U.S. General Services Administration
GTCC	Greater Than Class C
HP	Health Physics
HSM	Horizontal Storage Module
INPO	Institute of Nuclear Power Operations
ISFSI	Independent Spent Fuel Storage Installation
LLRW	Low-Level Radioactive Waste
LOP	Life-of-Plant
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MWt	Megawatt thermal
Turkey Point	Turkey Point Nuclear Plant
NRC	Nuclear Regulatory Commission
ORISE	Oak Ridge Institute for Science and Education
PCB	Polychlorinated Biphenyl
PSDAR	Post-Shutdown Decommissioning Activities Report
PWR	Pressurized Water Reactor
WBS	Work Breakdown Structure
WCS	Waste Control Specialists LLC
UCF	Unit Cost Factor

1.0 EXECUTIVE SUMMARY

This report presents the 2020 Decommissioning Cost Estimate (DCE) Study of the Turkey Point Nuclear Plant, Independent Spent Fuel Storage Installation (Ref. No 1). The Turkey Point Nuclear Plant (Turkey Point) is owned and operated by Florida Power & Light Company (FPL).

This report has been performed to furnish an estimate, for financial planning purposes, of the costs for the Independent Spent Fuel Storage Installation (ISFSI) decommissioning pursuant to 10 CFR 72.30 (Ref. No. 2).

On June 17, 2011, the NRC published a final rule amending its regulations to improve decommissioning planning. The rule became effective on December 17, 2012. This rule requires licensees under Part 72 to plan for ISFSI decommissioning. The rule includes, under 10 CFR Part 72.30, the preparation and reporting of decommissioning cost estimates for ISFSIs. NRC guidance for ISFSI decommissioning cost estimates is contained in NUREG-1757, "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness." (Ref. No. 3)

NUREG-1757 does not apply to licensees under 10 CFR Part 50 (Ref. No. 4) nor does it eliminate the need to follow Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," (Ref. No. 5) or NUREG-1713 (Ref No. 6). It does provide additional information to support the development of cost estimates for ISFSI decommissioning. This estimate was prepared in accordance with the guidelines provided in Regulatory Guide 1.202 and NUREG-1713. In addition, it does take into account the guidelines identified in NUREG-1757.

The study methodology follows the basic approach originally presented in the Atomic Industrial Forum/National Environmental Studies Project Report AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Ref. No. 7). The estimate is based on compliance with current regulatory requirements and proven decommissioning technologies.

This study reports the cost for decommissioning the Turkey Point ISFSI as a separate sub-project within the overall site-wide decommissioning, spent fuel management and site restoration programs implemented following shutdown. These sub-project costs occur during and after the completion of the removal of all spent fuel.

This study reports the ISFSI decommissioning costs for the following two scenarios defined by FPL:

Scenario 1 – Prompt Decon following Unit 4 Shutdown

- Unit 3 Shutdown July 19, 2052
- Unit 4 Shutdown April 10, 2053
- DECON Methodology after Unit 4 is permanently shutdown in 2053
- Transfer spent fuel from pool to DOE prior to shutdown beginning in 2031
- Fuel pools empty by 2056
- All Dry Fuel transferred from ISFSI to DOE by 2073
- Decommissioning will be performed by FPL and a Decommissioning General Contractor (DGC)

The ISFSI decommissioning cost estimate results are provided in 2020 dollars in Table 1-1.

Table 1-1

Florida Power and Light - Turkey Point ISFISI Decommissioning Cost Summary (thousands of 2020 dollars)	
Scenario	**ISFSI D&D 72.30**
1 - Prompt Decon	**2,636**

Table 1-2 provides the distribution of costs between Units 3 and 4.

Table 1-2

Florida Power and Light - Turkey Point ISFISI Cost Summary (thousands of 2020 dollars)			
Scenario	Unit 3	Unit 4	Total
1 - Prompt Decon	1,054	1,582	2,636

The estimate inventories are based on the size of the ISFSI required to provide post-shutdown dry storage of spent fuel and the supporting infrastructure. These inventories, Energy*Solutions*' (ES) proprietary Unit Cost Factors (UCFs), historical data and execution strategy were used to generate required manhours, waste volumes and classification, and estimated costs. A detailed project estimate is included in Appendix A.

The schedule reflects Energy*Solutions'* historical execution strategy and experience to sequence activity-dependent or distributed decommissioning elements such as planning and preparations, major component removal, building decontamination, building demolition, etc. The schedule is summarized in Table 1-3 below.

Table 1-3 below provides a schedule summary for a Prompt DECON scenario with Unit 3 Shutdown in 2052 and Unit 4 Shutdown in 2053.

Table 1-3

FPL DCE-02 Turkey Point Units 3 & 4 Scenario 1 Schedule Summary	
Year	**Item**
2031	DOE starts accepting fuel from spent fuel pool
2052	Unit 3 Shutdown
2053	Unit 4 Shutdown
2056	Unit 3 Fuel Pool Empty
2056	Unit 4 Fuel Pool Empty
2057	Start Demolition
2063	Decommissioning and Site Restoration Complete
2073	ISFSI Empty
2074	ISFSI Decommissioning and Site Restoration Complete

2.0 INTRODUCTION

2.1 Study Objective

This report presents a 2020 update of the 2015 Decommissioning Cost Study of the Turkey Point Independent Spent Fuel Storage Installation (Ref. No. 1), hereinafter referred to as the 2015 ISFSI Cost Study. The Turkey Point Nuclear Plant (Turkey Point) is owned and operated by FPL

This report has been performed to furnish an estimate, for financial planning purposes, of the costs for the Independent Spent Fuel Storage Installation (ISFSI) decommissioning pursuant to 10 CFR 72.30 (Ref. No. 2).

On June 17, 2011, the NRC published a final rule amending its regulations to improve decommissioning planning. The rule became effective on December 17, 2012. This rule requires licensees under Part 72 to plan for ISFSI decommissioning. The rule includes, under 10 CFR Part 72.30, the preparation and reporting of decommissioning cost estimates for ISFSIs. NRC guidance for ISFSI decommissioning cost estimates is contained in NUREG-1757, "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness." (Ref. No. 3)

NUREG-1757 does not apply to licensees under 10 CFR Part 50 (Ref. No. 4) nor does it eliminate the need to follow Regulatory Guide 1.202, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," (Ref. No. 5) or NUREG-1713 (Ref No. 6). It does provide additional information to support the development of cost estimates for ISFSI decommissioning. This estimate was prepared in accordance with the guidelines provided in Regulatory Guide 1.202 and NUREG-1713. In addition, it does take into account the guidelines identified in NUREG-1757.

The study methodology follows the basic approach originally presented in the Atomic Industrial Forum/National Environmental Studies Project Report AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," (Ref. No. 7). The estimate is based on compliance with current regulatory requirements and proven decommissioning technologies.

This study reports the cost for decommissioning the Turkey Point ISFSI as a separate sub-project within the overall site-wide decommissioning, spent fuel management and site restoration programs implemented following shut-down. These sub-project costs occur during and after the completion of the removal of all spent fuel.

2.2 Regulatory Framework

Provisions of current laws and regulations affecting the ISFSI decommissioning and waste management are as follows:

- 10 CFR 72.30(b) requires that a licensee under Part 72 must submit a decommissioning funding plan that contains a detailed decommissioning cost estimate in an amount reflecting:
    a. The cost of an independent contractor to perform all decommissioning activities.
    b. An adequate contingency factor.
    c. The cost for unrestricted use.

Decommissioning Alternatives

The three basic methods for decommissioning are DECON, SAFSTOR, and ENTOMB, which are summarized as follows:

1. DECON: The equipment, structures, and portions of the facility and site that contain radioactive contaminants are promptly removed or decontaminated to a level that permits termination of the license after cessation of operations.

2. SAFSTOR: The facility is placed in a safe, stable condition and maintained in that state (safe storage). The facility is decontaminated and dismantled at the end of the storage period to levels that permit license termination. NRC regulations require decommissioning to be completed within 60 years of cessation of operation. Durations less than the regulatory-allowed maximum may be referred to as Modified SAFSTOR.

3. ENTOMB: Radioactive structures, systems, and components are encased in a structurally long-lived substance, such as concrete. The entombed structure is appropriately maintained and monitored until radioactivity decays to a level that permits termination of the license. Since entombment will exceed the requirement for decommissioning to be completed within 60 years of cessation of operation, NRC handles entombment requests on a case-by-case basis.

The ISFSI will be decommissioned as soon as is practical after the removal of all spent fuel.

3.0 STUDY METHODOLOGY

3.1 General Description

Energy*Solutions* maintains a proprietary decommissioning cost model based upon the fundamental technical approach established in AIF/NESP-036, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," dated May 1986 (Ref. No. 7). The cost model has been continuously updated in accordance with regulatory requirements, Energy*Solutions*' actual project experience, and the latest industry technologies. The cost model includes elements for estimating distributed (direct costs) and undistributed costs. Distributed costs are activity specific and include planning and preparation costs as well as the decontamination, packaging, disposal, and removal of major components and systems. Undistributed costs, sometimes referred to as collateral costs, are typically time-dependent costs such as utility and decommissioning general contractor staff, property taxes, insurance, regulatory fees and permits, energy costs, and security staff.

The methodology for preparing cost estimates for a selected decommissioning alternative requires development of a site-specific detailed work activity sequence based upon the plant inventory. The activity sequence is used to define the labor, material, equipment, energy resources, and duration required for each activity. In the case of major components, individual work sequence activity analyses are performed based on the physical and radiological characteristics of the component and the packaging, transportation, and disposal options available.

In the case of structures and small components and equipment such as piping, pumps, and tanks, the work durations and costs are calculated based on Unit Cost Factors (UCFs). UCFs are economic parameters developed to express costs per unit of work output, piece of equipment, or time. They are developed using decommissioning experience, information on the latest technology applicable to decommissioning, and engineering judgment. The total cost of a specific decommissioning activity can be determined by multiplying the total number of units associated with that activity by the UCF, expressed as $/unit, for that activity. For example, the estimated demolition cost of a non-contaminated concrete structure can be obtained by multiplying the volume of concrete in the structure by the UCF for non-contaminated reinforced concrete demolition, expressed in $/unit volume. Each UCF has associated with it a man-hours/unit and schedule-hours/unit. From these values, total man-hours and total schedule-hours can be determined for a particular activity.

3.2 Schedule Analysis

Energy*Solutions* has established a Work Breakdown Structure (WBS) that typically defines decommissioning costs and the schedule into six primary periods to define the scope of work. Those periods are:

- Period 1 – Shutdown and Transition
- Period 2 – SAFSTOR
- Period 3 – Decommissioning and License Termination
- Period 4 – Site Restoration
- Period 5 – Dry Fuel / GTCC Storage and Transfer
- Period 6 – ISFSI Decommissioning

The work is broken down further into sub-periods as defined in Section 4.2 below.
Once the work activity durations are established, a time-phased schedule and cash-flow analysis are performed using Energy*Solutions*' InEight estimating and scheduling tools to generate annual spending.

The schedule accounts for constraints such as spent fuel cooling periods and regulatory reviews. The schedule is typically delineated into periods that differentiate manpower requirements and undistributed costs.

3.3 Decommissioning Staff

Energy*Solutions*' philosophy towards decommissioning is to assume that the project will be performed in an efficiently planned and executed manner using project personnel experienced in decommissioning. These ISFSI D&D scenarios assume that the decommissioning will be performed by an experienced and qualified DGC. It is also assumed that the utility staff will be supplemented by professional consulting engineering, particularly in the planning and preparation phase.

Staffing levels for each project period are based on the Atomic Industrial Forum (AIF) guidelines, Energy*Solutions*' project experience and industry practice. The sizes of the staffs are varied in each period in accordance with the requirements of the work activities. Staffing has been organized into the following departments or functional groups:

- Administration
- Engineering
- Health Physics
- Radiation Protection
- Management
- Maintenance and Operations
- Quality Assurance
- Security Administration
- Security Guard Force
- Waste Operations
- DGC Staff

3.4 Waste Disposal

No radioactive waste is anticipated to be generated during the decommissioning of the ISFSI.

Non-Radioactive Non-Hazardous Waste Disposal

Energy*Solutions* assumes that recyclable, non-radioactive scrap metal resulting from the decommissioning program will be transported to a scrap metal dealer. However, no credit is assumed in the estimate for the value of the scrap metal. Concrete debris is assumed to be processed by size reduction, with removal of structural reinforcing steel, and used on site as engineered fill for voids. Asphalt from parking lots and roadways is assumed to be stockpiled on site and removed, at no cost to the project, by a recycler. All other demolition debris is removed from the site and disposed of at a local construction debris landfill.

Hazardous and Industrial Waste Disposal

Uncontaminated lead shielding remaining after shutdown was assumed to be removed from its installed locations and shipped offsite by entities having a need for the material. The entities receive the lead at no charge in return for providing the removal and shipping services. Non-Radioactive contaminated surfaces coated with lead-based paint will be removed as non-hazardous building demolition debris. All other

chemicals and hazardous materials present at shutdown are assumed to be removed and disposed of by the plant staff prior to decommissioning as a normal part of plant operations.

3.5 Final Status Survey

The cost of performing a final status survey (FSS) is based on NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)" (Ref. No. 8). Estimates of MARSSIM Class I, II and III survey designations are based on radiological characterization data furnished by FPL and assumptions regarding contamination resulting from small and large component removal activities. The FSS activity cost calculation includes the in-place remote survey of underground metal and concrete pipe, soil, and groundwater sampling and analysis. Estimated costs for NRC and Oak Ridge Institute for Science and Education (ORISE) verification are also included, and the NRC review period is incorporated into the project schedule.

3.6 Contingency

Contingencies are applied to cost estimates primarily to allow for unknown or unplanned occurrences during the actual program, e.g. increased radioactive contamination over that expected, equipment breakdowns, weather delays, and labor strikes. This is consistent with the definition provided in the DOE Cost Estimating Guide, DOE G 430.1-1, March 1997 (DOE G) (Ref. No. 9): Contingency "covers costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties within the defined project scope. The amount of contingency will depend on the status of design, procurement, and construction; and the complexity and uncertainties of the component parts of the project. Contingency is not to be used to avoid making an accurate assessment of expected costs."

NUREG-1757 recommends a contingency of 25%, which is consistent with the analysis and guidance contained in NUREG/CR-6477. However, based on previous experience of projects completed and proposals submitted Energy*Solutions* has included a 15% contingency in this ISFSI Decommissioning Cost Estimate.

3.7 Cost Reporting

Total project costs are aggregated from the distributed activities (direct costs) and undistributed costs into the following categories:

- Labor
- Materials and Equipment
- Waste Transportation and Disposal
- Other Direct Costs

Other costs include property taxes, insurance, license fees, permits, and energy. Waste disposal costs are the summation of packaging, transportation, base disposal rate, and any applicable surcharges. Health physics (HP) supplies and small tool costs are calculated as a component of each distributed activity cost and included in the category of Material and Equipment, with the exception that HP supplies for utility staff are calculated and reported as an undistributed line item. A contingency is then applied to each activity.

4.0 SITE SPECIFIC TECHNICAL APPROACH

4.1 Facility Description

Turkey Point Nuclear Plant is a nuclear-powered electrical generating facility consisting of two PWRs. The plant is located near Homestead, Florida, 25 miles south of Miami, Florida. The plant is situated on an 11,000-acre tract of land which is dominated by protected mangrove swamps. The cooling canals encompass an additional 6,800 acres.

Both Unit 3 and Unit 4 are three-loop Westinghouse PWRs with a current thermal output of 2,644 MWt and a design electrical rating of 844 MWe and 840 MWe, respectively. The current license expiration dates for Units 3 and 4 are in 2052 and 2053, respectively.

Turkey Point has an existing ISFSI supporting Units 3 and 4. The ISFSI is operated under the 10 CFR Part 72 general license using the manufacturer's Certificate of Compliance.

4.2 Decommissioning Periods

Energy*Solutions* has established a Work Breakdown Structure (WBS) that typically defines decommissioning cost estimates with six primary periods to define the scope of work. Those periods are:

- Period 1 – Shutdown and Transition
- Period 2 – SAFSTOR
- Period 3 – Decommissioning and License Termination
- Period 4 – Site Restoration
- Period 5 – Dry Fuel / GTCC Storage and Transfer
- Period 6 – ISFSI Decommissioning

The work is broken down further into sub-periods.

For this site-specific cost study, all of the ISFSI decommissioning work will be performed during Period 6 and a summary of activities performed for both scenarios are as follows:

Period 6 – ISFSI Decommissioning

ISFSI D&D Planning and Preparations

- Prepare, Submit and NRC Review of License Termination Plan

ISFSI Final Status Surveys

- Verification Surveys
- Prepare, Submit and NRC Review of Final Report on ISFSI Decommissioning

Undistributed Costs for ISFSI Decommissioning

- General Contractor Staff

4.3 Decommissioning Staff

Energy*Solutions* developed staffing based on the assumption that decommissioning will be performed by an experienced and qualified Decommissioning General Contractor, with oversight, management and security of the decommissioning operations performed by the utility staff. It is also assumed that the utility staff will be supplemented by professional consulting engineering, particularly in the planning and preparation phase. The sizes of the staffs are varied in each period in accordance with the requirements of the work activities.

5.0 BASES OF ESTIMATE AND KEY ASSUMPTIONS

The bases of, and key assumptions for, this site-specific decommissioning estimate are presented below:

1. All cost data used in this study are in 2020 dollars.

2. Total and subtotal amounts are rounded.

3. Energy*Solutions* developed project schedules based on Unit 3 and Unit 4 shutdown dates of 2052 and 2053, respectively, and fuel shipping schedules provided by FPL.

4. The decommissioning will be performed using currently available technologies.

5. The estimate is based on the site and scenario specific ISFSI configuration.

6. All transformers on site following shutdown are assumed to be polychlorinated biphenyl (PCB)-free, therefore, this estimate does not include costs for disposition of PCB contaminated transformers.

7. Cost for transportation of clean scrap metal to a recycler is included in the estimate; however, no credit is taken for the value of the scrap metal. All other concrete and demolition debris are removed from the site and disposed of at a local off-site construction landfill.

8. The estimate is based on final site restoration, in which all existing and proposed structures, with the exception of the switchyard, will be removed. Clean demolition costs assume that all site improvements will be removed in their entirety.

9. Turkey Point currently has an existing ISFSI on site. The ISFSI is operated under the 10 CFR Part 72 general license using the manufacturer's Certificate of Compliance. Construction costs for any expansion of the ISFSI required for additional storage has not been included, but demolition has been included in the estimate.

10. The ISFSI pad and fuel modules are assumed to have no activated concrete or surface contamination; therefore, no radiological decommissioning is assumed to be required. As a sub-project, the ISFSI D&D estimate is limited to (a) the preparation of a license termination plan, and (b) the planning and performance of a Final Status Survey conducted during the ISFSI dismantlement and demolition to verify that NRC release limits are being met. The costs of dismantlement and demolition of the ISFSI are accounted for separately.

11. Energy*Solutions* has included NRC inspection fees during each decommissioning period based on the type and level of activities being performed.

12. Supplies and services costs were calculated based on information provided by FPL and adjusted by Energy*Solutions* to match the requirements of each period, based on staffing levels.

13. Utility staff and security positions, and average direct-burdened salary data were supplied by FPL.

14. DGC staff salaries, including overhead and profit, were determined by using Energy*Solutions*' project experience and standard assumptions for these rates.

15. Certain professional personnel used for the planning and preparation activities, and DGC personnel, that are based in the local economy are assumed to be paid per diem based on area per diem rates from U.S. General Services Administration (GSA).

16. This study has considered the impact of the September 11, 2001 terrorist attack on security force staffing and requirement. The security guard force included in this estimate has been sized accordingly.

17. This study follows the occupational exposure principles of As Low As Reasonably Achievable (ALARA) through the use of productivity loss factors that incorporate such items as the use of respiratory protection and personnel protective clothing. These factors increase the work duration and cost.

18. The costs of all required safety analyses and safety measures for the protection of the general public, the environment, and decommissioning workers are included in the cost estimates. This reflects the requirements of:

10 CFR 20	Standards for Protection Against Radiation
10 CFR 50	Domestic Licensing of Production and Utilization Facilities
10 CFR 61	Licensing Requirements for Land Disposal of Radioactive Waste
10 CFR 71	Packaging of Radioactive Material for Transport
10 CFR 72	Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste
29 CFR 1910	Occupational Safety and Health Standards
49 CFR 170-189	Department of Transportation Regulations Governing the Transport of Hazardous Materials
Reg. Guide 1.159	Assuring the Availability of Funds for Decommissioning Nuclear Reactors

19. Activity labor costs do not include any allowance for delays between activities, nor is there any cost allowance for craft labor retained on site while waiting for work to become available.

6.0 STUDY RESULTS

The study results for each of the ISFSI scenarios are presented in this section.

The cost estimate results are provided in Table 6-1 below. This table provides Independent Spent Fuel Storage Installation (ISFSI) decommissioning costs pursuant to 10 CFR 72.30.

Table 6-1

Florida Power and Light - Turkey Point ISFISI Decommissioning Cost Summary (thousands of 2020 dollars)	
Scenario	**ISFSI D&D 72.30**
1 - Prompt Decon	**2,636**

Summary cost tables are shown for each scenario below. Detailed estimates for each scenario are provided in Appendix A.

6.1 Scenario 1 – Prompt Decon following Unit 4 Shutdown

Cost Summary

Table 6-2 below provides the cost estimate results for Scenario 1 by period and separated into Unit 3, Unit 4 and Total.

Table 6-2

Florida Power and Light - Turkey Point ISFISI - Cost Summary by Period & Unit (thousands of 2020 dollars)				
Period	Item Description	Unit 3	Unit 4	Total Cost
Period 6	ISFSI DECOMMISSIONING	1,054	1,582	2,636

Table 6-3 below provides the cost estimate results for Scenario 1 organized by period and separated by cost type.

Table 6-3

Florida Power and Light - Turkey Point ISFISI Cost Summary by Period & Cost Type (thousands of 2020 dollars)							
Period	Item Description	Labor Cost	Materials & Equipment	Waste Transport & Disposal	Other Direct Cost (ODC)	Contingency	Total Cost
Period 6	ISFSI DECOMMISSIONING	2,077	55	-	160	344	2,636

A detailed estimate is provided in Appendix A.

Schedule Summary

Table 6-4 below provides a schedule summary for Scenario 1 based on a DECON scenario with Unit 3 Shutdown 2052 and Unit 4 Shutdown in 2053.

Table 6-4

FPL DCE-02 Turkey Point Units 3 & 4 Scenario 1 Schedule Summary	
Year	**Item**
2031	DOE starts accepting fuel from spent fuel pool
2052	Unit 3 Shutdown
2053	Unit 4 Shutdown
2056	Unit 3 Fuel Pool Empty
2056	Unit 4 Fuel Pool Empty
2057	Start Demolition
2063	Decommissioning and Site Restoration Complete
2073	ISFSI Empty
2074	ISFSI Decommissioning and Site Restoration Complete

Project Staffing

Table 6-5 below provides project staffing for Scenario 1 organized by period and staff group.

Table 6-5

Period 6 - ISFSI Decommissioning		2070	2071	2072	2073	2074	2075
Utility Staff		-	-	-	-	-	-
Project Management					1	0.5	
Engineering					1	0.5	
Health Physics/Rad Protection						0.5	
Administration						-	
Maintenance & Operations							
Quality Assurance							
Waste Management							
General Contractor Staff		-	-	-	2	1.5	-
Period 6 - ISFSI Decommissioning		-	-	-	2	1.5	-

Waste Disposal Volumes

The ISFSI pad and fuel modules assumed to have no activated concrete or surface contamination.

7.0 REFERENCES

1. Energy*Solutions*, LLC, "2015 Decommissioning Cost Study of the Turkey Point Independent Spent Fuel Storage Installation," Document Number 164005-01-DCE-012, Rev. 0, January 7, 2015.

2. U.S. Nuclear Regulatory Commission, "Domestic Licensing of Production and Utilization Facilities," 10 CFR Part 72, 2008.

3. U.S. Nuclear Regulatory Commission "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness." NUREG – 1757, February, 2012.

4. U.S. Nuclear Regulatory Commission, "Domestic Licensing of Production and Utilization Facilities," 10 CFR Part 50, 2008.

5. U.S. Nuclear Regulatory Commission, "Standard Format and Content of Decommissioning Cost Estimates for Nuclear Power Reactors," Regulatory Guide 1.202, February 2005.

6. U.S. Nuclear Regulatory Commission, "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors." NUREG 1713, December 2004.

7. Atomic Industrial Forum, Inc., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

8. U.S. Nuclear Regulatory Commission, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," NUREG-1575, Rev. 1, August 2000.

9. U.S. Department of Energy, "Cost Estimating Guide," DOE G 430.1-1, March 1997.

Appendix A

Florida Power and Light
Turkey Point
ISFSI

(thousands of 2020 dollars)

Period	Item Number	Item Description	Labor Cost	Materials & Equipment	Waste Transportation & Disposal	Other Direct Cost (ODC)	Contingency	Total Cost (Estimated)	License Termination	Spent Fuel Management	Site Restoration
Period 1 Total		**SHUTDOWN & TRANSITION**	-	-	-	-	-	-	-	-	-
Period 2 Total		**SAFSTOR**	-	-	-	-	-	-	-	-	-
Period 3 Total		**DECOMMISSIONING & LICENSE TERMINATION**	-	-	-	-	-	-	-	-	-
Period 4 Total		**SITE RESTORATION**	-	-	-	-	-	-	-	-	-
Period 5 Total		**DRY FUEL / GTCC STORAGE & TRANSFER**	-	-	-	-	-	-	-	-	-
	6a.1	Preparation and NRC Review of License Termination Plan	115	-	-	160	41	316	-	316	-
6a Total		**ISFSI D&D Planning & Preparations**	115	-	-	160	41	316	-	316	-
	6b.1	Clean Demolition of ISFSI			-	-	-	-	-	-	-
	6b.2	Demolition of ISFSI Support Structures			-	-	-	-	-	-	-
6b Total		**ISFSI and Support Structure Clean Demolition**	-	-	-	-	-	-	-	-	-
	6c.1	Verification Surveys	209	55	-	-	40	303	-	303	-
	6c.2	Preparation of Final Report on Decommissioning and NRC Review	116	-	-	-	17	133	-	133	-
6c Total		**ISFSI Final Status Surveys**	325	55	-	-	57	437	-	437	-
	6d.1	Utility Staff	-	-	-	-	-	-	-	-	-
	6d.2	Security Guard Force	-	-	-	-	-	-	-	-	-
	6d.3	General Contractor Staff	1,637	-	-	-	246	1,883	-	1,883	-
	6d.4	Property Taxes	-	-	-		-	-	-	-	-
	6d.5	Insurance	-	-	-		-	-	-	-	-
	6d.6	Corporate Support	-	-	-	-	-	-	-	-	-
	6d.7	Utility Staff HP Supplies	-	-	-	-	-	-	-	-	-
	6d.8	Materials and Services	-				-	-	-	-	-
	6d.9	Energy	-				-	-	-	-	-
	6d.10	NRC Inspection Fee	-	-	-	-	-	-	-	-	-
	6d.11	Licensing Fees	-	-	-	-	-	-	-	-	-
	6d.12	County & FEMA Fees	-	-	-		-	-	-	-	-
	6d.13	Licenses & Permits	-	-	-		-	-	-	-	-
6d Total		**Undistributed Costs for ISFSI Decommissioning**	1,637	-	-	-	246	1,883	-	1,883	-
Period 6 Total		**ISFSI DECOMMISSIONING**	2,077	55	-	160	344	2,636	-	2,636	-
GRAND TOTAL			2,077	55	-	160	344	2,636	-	2,636	-

ATTACHMENT 3

NextEra Energy
Seabrook Station

10 CFR 72.30 ISFSI Decommissioning Cost Estimate

1. Background and Introduction

The Nuclear Regulatory Commission (NRC) issued its final rule on Decommissioning Planning on June 17, 2011,[1] with the rule becoming effective on December 17, 2012. Subpart 72.30, "Financial assurance and recordkeeping for decommissioning," requires that each holder of, or applicant for, a license under this part must submit for NRC review and approval a decommissioning funding plan that contains information on how reasonable assurance will be provided that funds will be available to decommission the Independent Spent Fuel Storage Installation (ISFSI).

FPL/NextEra filed its initial ISFSI Decommissioning Funding Plan for Seabrook Station on December 17, 2012,[2] along with the other units in the fleet. Supplemental information was provided on August 12, 2014 in response to a request by the NRC for additional information.[3] FPL/NextEra filed an update to the ISFSI Decommissioning Funding Plan for Seabrook Station on March 30, 2017,[4] along with the other units in the fleet.

In accordance with the rule that states "at intervals not to exceed 3 years, the decommissioning funding plan must be resubmitted with adjustments as necessary to account for changes in costs and the extent of contamination," this letter provides an updated, detailed cost estimate for decommissioning the ISFSI at Seabrook Station in an amount reflecting:

1. The work is performed by an independent contractor;
2. An adequate contingency factor; and
3. Release of the facility and dry storage systems for unrestricted use, as specified in 10 CFR Part 20.1402

This letter also provides:

1. Identification of the key assumptions contained in the cost estimate; and

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1 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, Number 117 (p 35512 et seq.), June 17, 2011

2 FPL Letter L-2012-442, ISFSI Decommissioning Funding Plans, NRC ADAMS Accession No. ML12354A134, dated December 17, 2012

3 FPL Letter L-2014-214, Reply to Request for Additional Information for Review of the Decommissioning Funding Plans Regarding the Independent Spent Fuel Storage Installations, NRC ADAMS Accession No. ML14225A655, dated August 12, 2014

4 FPL Letter L-2017-040, Decommissioning Funding Status Reports/Independent Spent Fuel Installation (ISFSI) Financial Assurance Update, NRC ADAMS Accession No. ML17093A722, dated March 30, 2017

2. The volume of onsite subsurface material containing residual radioactivity, if any, that will require remediation to meet the criteria for license termination.

2. Spent Fuel Management Strategy

The operating license for Seabrook Station is currently set to expire on March 15, 2050. Approximately 3,330 spent assemblies are currently projected to be generated over the life of the plant.

Assuming that the unit operates to 2050, and no spent fuel is transferred to the DOE during this time period, approximately 2,112 spent fuel assemblies in 66 modules will have been relocated to the ISFSI during plant operations. The remaining 1,218 spent fuel assemblies are expected to be transferred to the ISFSI once operations cease.

To facilitate immediate dismantling, the spent fuel is assumed to be packaged in dry storage containers (DSCs) for interim storage at the ISFSI. Transferring the spent fuel from the pool to the ISFSI will permit decontamination and dismantling of the spent fuel pool systems and fuel pool areas.

Completion of the ISFSI decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site. 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.[5] However, for purposes of this analysis, NextEra Energy Seabrook, LLC's (NextEra, f/k/a FPL Energy Seabrook, LLC) current spent fuel management plan for the Seabrook Station spent fuel is based on the New Hampshire Nuclear Decommissioning Finance Committee's directive in its 2009 Order. In that Order, fuel is assumed to remain on site until 2100.[6]

3. ISFSI Decommissioning Strategy

At the conclusion of the spent fuel transfer process the ISFSI will be promptly decommissioned (similar to the power reactor DECON alternative) by removing and disposing of residual radioactivity and verifying that remaining materials satisfy NRC release criteria.

For purposes of providing an estimate for a funding plan, financial assurance is expected to be provided on the basis of a prompt ISFSI decommissioning scenario. In this estimate

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5 U.S. Code of Federal Regulations, Title 10, Part 961.11, Article IV – Responsibilities of the Parties, B. DOE Responsibilities, 5.(a) … DOE shall issue an annual acceptance priority ranking for receipt of SNF and/or HLW at the DOE repository. This priority ranking shall be based on the age of SNF and/or HLW as calculated from the date of discharge of such materials from the civilian nuclear power reactor. The oldest fuel or waste will have the highest priority for acceptance, except as …"

6 New Hampshire Nuclear Decommissioning Financing Committee's December 30, 2009 Final Report and Order in Docket NDFC 2009-1

the ISFSI decommissioning is considered an independent project, regardless of the decommissioning alternative identified for the nuclear power plant.

4. ISFSI Description

The Seabrook Station ISFSI is based upon a NUHOMS®-HD-32PTH dry storage system and operated under a general license (10 CFR Part 50). The NUHOMS® system is comprised of a DSC and a horizontal storage module (HSM). The DSCs are assumed to be transferred directly to the DOE and not repackaged. Some of the remaining HSMs are assumed to have residual radioactivity due to some minor level of neutron-induced activation as a result of the long-term storage of the spent fuel. The cost to dispose of residual radioactivity, and verify that the remaining facility and surrounding environs meet the NRC's radiological limits established for unrestricted use, form the basis of the ISFSI decommissioning estimate.

NextEra's current spent fuel management plan for the Seabrook Station spent fuel would result in 105 HSMs (nominal 32 assemblies per DSC) being in position on the storage pad at the site after all spent fuel has been removed from the spent fuel pool. This represents 100% of the total spent fuel projected to be generated during the currently licensed operating period.

In addition to the spent fuel HSMs located on the ISFSI pad after shutdown there are projected to be additional HSMs that are expected to be used for Greater-than-Class-C (GTCC) storage. The HSMs used for the GTCC canisters (estimated quantity of 5) are not expected to have any interior contamination or residual activation and can be reused or disposed of by conventional means after a final status survey.

Table 1 provides the significant quantities and physical dimensions used as the basis in developing the ISFSI decommissioning estimate.

5. Key Assumptions / Estimating Approach

The decommissioning estimate is based on the configuration of the ISFSI expected after all spent fuel and GTCC material has been removed from the site. The configuration of the ISFSI is based on Seabrook Station operating until the end of its current license, March 15, 2050, and the assumptions associated with DOE's spent fuel acceptance, as previously described.

The current size of the ISFSI pad may not be sufficient to store the projected amount of spent fuel for 60 years of operations. For purposes of this analysis, the pad is assumed to be extended to accommodate the additional modules.

It is not expected that the HSMs will have any interior or exterior radioactive surface contamination. It is 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. Any neutron activation of the steel and concrete is expected to be extremely small. To validate this assumption, the estimate accounts for characterization of 10% of the HSMs; it is likely that some of this characterization will take place well before the last of the fuel is removed from the ISFSI in order to establish a more definitive decommissioning scope.

The decommissioning estimate is based on the premise that some of the DSC support structure within the HSMs and surrounding concrete will contain low levels of neutron-induced residual radioactivity that would necessitate remediation at the time of decommissioning. As an allowance, 7 of the 105 HSMs are assumed to be affected, i.e., contain residual radioactivity. The allowance quantity is based upon the number of DSCs required for the final core off-load (i.e., 193 offloaded assemblies, 32 assemblies per DSC) which results in a total of approximately 7 HSMs that contain residual radioactivity.

It is not expected that there will be any residual contamination left on the concrete ISFSI pad. It is 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. Therefore, it is assumed for this analysis that the ISFSI pad will not be contaminated. As such, only verification surveys are included for the pad in the decommissioning estimate.

The Seabrook ISFSI pad is placed on a bedrock foundation. NextEra has no record of onsite subsurface material associated with the ISFSI containing residual radioactivity that will require remediation to meet the criteria for license termination.

To support an application for License Termination, the estimate assumes that a Final Status Survey will be performed; this will include a 100% survey of the ISFSI pad and the immediate area surrounding the pad, and a significant fraction of the HSMs surfaces.

Decommissioning is assumed to be performed by an independent contractor. As such, essentially all labor, equipment, and material costs are based on national averages, i.e., costs from national publications such as RSMeans' Building Construction Cost Data (adjusted for regional variations), and laboratory service costs are based on vendor price lists. NextEra, as licensee, will oversee the site activities; the estimate includes NextEra's labor and overhead costs. The licensee's costs are based upon current, average, fleet salaries and associated expenses, for selected positions.

Low-level radioactive waste transportation and disposal costs are based on rates consistent with the most recently developed decommissioning cost estimate, completed in May 2019.[7]

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7 "Decommissioning Cost Analysis for the Seabrook Station," TLG Document No. N35-1765-001, Rev. 0, dated May 2019

Costs are reported in year end 2019 dollars.

Contingency has been added at an overall rate of 25%. This is consistent with the contingency evaluation criteria referenced by the NRC in NUREG-1757.[8]

The effects, if any, since the last submittal of the ISFSI decommissioning funding plan of the following events listed in 10 CFR 72.30 (c) (1)- (4) have been specifically considered in the decommissioning cost estimate:

(1) Spills of radioactive material producing additional residual radioactivity in onsite subsurface material: There have been no spills at the ISFSI.

(2) Facility modifications: There have been no facility modifications in the past three years that affect the decommissioning cost estimate.

(3) Changes in authorized possession limits: There are no changes in authorized possession limits that affect the decommissioning cost estimate.

(4) Actual remediation costs that exceed the previous cost estimate: No actual remediation costs have been incurred, so no actual remediation costs exceed the previous cost estimate.

The estimate is limited to costs necessary to terminate the ISFSI's NRC license and meet the §20.1402 criteria for unrestricted use. Disposition of released material and structures is outside the scope of the estimate.

6. Cost Estimate

The estimated cost to decommission the ISFSI and release the facility for unrestricted use is provided in Table 2. The cost has been organized into three phases, including:

- An initial planning phase - empty HSMs are characterized and the specifications and work procedures for the decontamination (DSC support structure removal) developed.
- The remediation phase - residual radioactivity is removed, packaged in certified waste containers, transported to the low-level waste site, and disposed of at low-level waste.
- The final phase - license termination surveys, independent surveys are completed, and an application for license termination submitted.

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8 "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. Nuclear Regulatory Commission's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Volume 3, Revision 1, February 2012

In addition to the direct costs associated with a contractor providing the decommissioning services, the estimate also contains costs for the NRC (and NRC contractor), NextEra's oversight staff, site security (industrial), and other site operating costs.

For estimating purposes, it should be conservatively assumed that all expenditures will be incurred in the year 2101, the year following all spent fuel removal.

Table 1
Significant Quantities and Physical Dimensions

ISFSI Pad

Item	Length (ft)	Width (ft)	Residual Radioactivity
ISFSI Pad (existing)	462	123	No

ISFSI Horizontal Storage Module

Item	Value	Notes (all dimensions are nominal)
Outside Height (inches)	222	without vent cover
Outside Length (inches)	248	without shield walls
Outside Width (inches)	116	without shield walls
Quantity (total)	110	spent fuel (105) GTCC (5)
Quantity (with residual radioactivity)	7	equivalent to the number of HSMs used to store last complete core offload
HSM Concrete with Potential Activation (pounds)	2,163,000	
HSM Internal Steel with Residual Radioactivity (pounds)	25,650	
Low-Level Radioactive Waste (cubic feet)	19,311	includes disposition of transfer cask and any dry active waste (DAW)
Low-Level Radioactive Waste (packaged density)	118	average packaged weight density, excluding transfer cask which is shipped intact

Other Potentially Impacted Items

Item	Value	Notes
Number of HSMs used for GTCC storage	5	no residual radioactivity

Table 2
ISFSI Decommissioning Costs[1] and Waste Volumes

	(thousands, 2019 dollars)						Waste Volume	Person-Hours	
	Removal	Packaging	Transport	Disposal	Other	Total	(cubic feet)	Craft	Oversight and Contractor
Decommissioning Contractor									
Planning (characterization, specs and procedures)	-	-	-	-	292	292	-	-	1,168
Remediation (activated metal removal)	48	142	1,423	1,464	-	3,077	19,311	298	-
License Termination (radiological surveys)	-	-	-	-	1,680	1,680	-	13,559	-
Subtotal	48	142	1,423	1,464	1,972	5,049	19,311	13,856	1,168
Supporting Costs									
NRC and NRC Contractor Fees and Costs	-	-	-	-	451	451	-	-	1,153
Insurance	-	-	-	-	94	94	-	-	-
NH Disposal Tax	-	-	-	-	290	290	-	-	-
Plant energy budget	-	-	-	-	87	87	-	-	-
Security (industrial)	-	-	-	-	186	186	-	-	5,082
Licensee Oversight Staff	-	-	-	-	317	317	-	-	3,855
Subtotal	-	-	-	-	1,425	1,425	-	-	10,090
Total (w/o contingency)	48	142	1,423	1,464	3,397	6,474	19,311	13,856	11,258
Total (w/25% contingency)	61	177	1,778	1,830	4,246	8,092			

Note 1: for funding planning purposes decommissioning costs can be assumed to be incurred in year 2101

TLG Services, Inc.