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Director, Nuclear Licensing

CNRO-2019-00005

10 CFR 50.75(f)(1)  
10 CFR 50.82(a)(8)(v)

March 28, 2019

ATTN: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: Decommissioning Funding Status Report per 10 CFR §50.75(f)(1) and  
10 CFR 50.82(a)(8)(v) -- Entergy Nuclear Operations, Inc.

Big Rock Point Nuclear Plant  
Docket No. 50-155  
License No. DPR-6

Indian Point Nuclear Generating  
Stations 1, 2, & 3  
Docket Nos. 50-3, 50-247, & 50-286  
License Nos. DPR-5, DPR-26, & DPR-64

Palisades Nuclear Power Plant  
Docket No. 50-255  
License No. DPR-20

Pilgrim Nuclear Power Station  
Docket 50-293  
License No. DPR-35

Vermont Yankee Nuclear Power  
Station  
Docket No. 50-271  
License No. DPR-28

Dear Sir or Madam:

10 CFR 50.75(f)(1) requires each power reactor licensee to report to the NRC by March 31, 1999, and every two years thereafter with certain exceptions, on the status of its decommissioning funding for each reactor, or share of a reactor, that it owns. 10 CFR 50.82(a)(8)(v) requires licensees of shutdown sites to report to the NRC annually, by March 31, on the status of decommissioning financial assurance for those sites. On behalf of Entergy Nuclear Indian Point 2, LLC (Indian Point 1 & 2), Entergy Nuclear Indian Point 3, LLC, Entergy Nuclear Vermont Yankee, LLC, Entergy Nuclear Generation Company (Pilgrim Station), and Entergy Nuclear Palisades, LLC (Palisades and Big Rock Point), Entergy Nuclear Operations, Inc. (ENOI) hereby submits the information requested for power reactors operated by ENOI.<sup>1</sup>

<sup>1</sup> In January 2019, Entergy Nuclear Vermont Yankee, LLC was acquired by NorthStar Nuclear Decommissioning Company, LLC, and after the acquisition, Entergy Nuclear Operations, Inc. (ENOI) was no longer the Licensee for Vermont Yankee. ENOI is submitting this report pertaining to Vermont Yankee because as of December 31, 2018, ENOI was the Licensee for the plant. Following the acquisition, ENOI is no longer responsible for Vermont Yankee decommissioning plans.

The reports provided in Attachments 1 through 14 for the licensed facilities addressed by this filing, were prepared in accordance with NUREG-1307 (Reference 1) and NRC Regulatory Issue Summary 2001-07 (Reference 2). Attachments 12, 13, and 14 are updated site specific decommissioning cost estimates for Indian Point Unit 1, Vermont Yankee, and Pilgrim, respectively. The Minimum Funding Assurance calculation worksheets, (not required for this filing) derived from LIC-205, Rev. 4, are provided in Attachment 15 for the convenience of the reviewer.

The estimated minimum decommissioning fund values were determined using the NRC's methodology in NUREG-1307, Rev 17 (Reference 1).

The trust fund amounts reported for each facility in the responses to item 3 represent the market value of decommissioning trust funds as of December 31, 2018 net of any material current income tax liability on realized gains, interest, dividends and other income of the trusts. The trusts for the following plants had estimated balances on their 2018 tax liabilities, not reflected in the trust fund balances, as follows (in thousands):

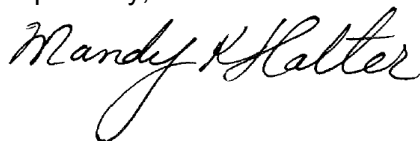
|                |    |        |
|----------------|----|--------|
| Indian Point 1 | \$ | 0      |
| Indian Point 2 | \$ | 0      |
| Indian Point 3 | \$ | 0      |
| Vermont Yankee | \$ | 0      |
| Pilgrim        | \$ | 20,330 |
| Palisades      | \$ | 0      |

In accordance with guidance provided by the NRC Staff in April 2014 requests for additional information (Accession No. ML14120A273) that "future 10 CFR 50.75(f) reports should clearly delineate estimated reactor and ISFSI decommissioning costs," the information in Attachments 1, 2, 3, 5, 7, 9, and 11 includes line item 2 identifying the ISFSI decommissioning obligation, from the most recent 10 CFR 72.30 filing. This obligation is also accounted for in the Excess/Shortfall calculations for each plant in Attachment 15

The aforementioned worksheets, using the December 31, 2018 trust fund balances and parent guarantee amounts, indicate that all of the plants covered by this submittal met or exceeded the NRC's funding requirements. Accordingly, the licensees conclude that no further action is required at this time to demonstrate adequate funding assurance for decommissioning the plants covered by this submittal.

There are no new commitments made in this letter. If you have any questions, please contact me at 601-368-5573.

Respectfully,



MKH/LJS/gpn

Attachments:

1. Entergy Nuclear Operations, Inc. Status of Decommissioning Funding – Indian Point 1
2. Entergy Nuclear Operations, Inc. Status of Decommissioning Funding – Indian Point 2
3. Entergy Nuclear Operations, Inc. Status of Decommissioning Funding – Indian Point 3
4. Entergy Nuclear Operations, Inc. Calculation of Minimum Amount – Indian Point
5. Entergy Nuclear Operations, Inc. Status of Decommissioning Funding – Vermont Yankee
6. Entergy Nuclear Operations, Inc. Calculation of Minimum Amount – Vermont Yankee
7. Entergy Nuclear Operations, Inc. Status of Decommissioning Funding – Pilgrim
8. Entergy Nuclear Operations, Inc. Calculation of Minimum Amount – Pilgrim
9. Entergy Nuclear Operations, Inc. Status of Decommissioning Funding – Palisades
10. Entergy Nuclear Operations, Inc. Calculation of Minimum Amount – Palisades
11. Entergy Nuclear Operations, Inc. Status of Decommissioning Funding – Big Rock Point
12. Entergy Nuclear Operations, Inc. IP1 DTF Balance Based on Decommissioning Funding Assurance Plan
13. Entergy Nuclear Operations, Inc. Vermont Yankee Annual Cash Flow Analysis
14. Entergy Nuclear Operations, Inc. Pilgrim Annual Cash Flow Analysis
15. Entergy Nuclear Operations, Inc. Minimum Financial Assurance Calculation Worksheets

- References:
- 1) NUREG-1307, “Report on Waste Burial Charges,” Revision 17, dated February 2019
  - 2) NRC Regulatory Issue Summary 2001-07, “10 CFR 50.75(f)(1) Reports on the Status of Decommissioning Funds (Due March 31, 2001)”

cc: USNRC Regional Administrator, Region I  
USNRC Regional Administrator, Region III

USNRC Project Manager, Indian Point 1  
USNRC Project Manager, Indian Point 2 / 3  
USNRC Project Manager, Palisades  
USNRC Project Manager, Pilgrim  
USNRC Project Manager, Vermont Yankee  
Ms. Margaret O'Banion, Project Manager, NRC/NRR/DORL

USNRC Resident Inspector, Indian Point 2 / 3  
USNRC Resident Inspector, Palisades  
USNRC Resident Inspector, Pilgrim  
USNRC Resident Inspector, Vermont Yankee

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding - Indian Point 1**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)**

Plant Name: **Indian Point Nuclear Generating Unit No. 1**

**10 CFR 50.75(f)(1)**

- |   |   |
|---|---|
| 1. Minimum Financial Assurance (MFA)  | \$583.42million <sup>[Note 1]</sup>                           |
| 2. ISFSI Obligation as of 12/31/18  | \$1.69 million <sup>[Note 2]</sup>                            |
| 3. Decommissioning Trust Fund Total<br>as of 12/31/18   | \$471.20 million  |
| 4. A schedule of the annual amounts remaining to be collected   | None  |
| 5. Assumptions used in determining rates of escalation in<br>decommissioning costs, rates of earnings on decommissioning<br>funds, and rates of other factors used in funding projections | 2% annual real rate<br>of return per<br>10 CFR 50.75(e)(1)(i) |
| 6. Any contracts upon which the licensee is relying pursuant to 10<br>CFR 50.75(e)(1)(v)  | None  |
| 7. Modifications occurring to a licensee's current method of providing<br>financial assurance since the last submitted report   | None  |
| 8. Any material changes to trust agreements   | None  |

Note 1: This amount is based upon total SAFSTOR expenditures for radiological remediation and license termination set forth in the updated Decommissioning Funding Assurance Plan and SAFSTOR analysis that are provided in Attachment 12. (Calculation of the NRC Minimum Amount is provided in Attachment 4.)

Note 2: From Entergy's Decommissioning Funding Plans (10 CFR 72.30) dated December 17, 2018 (Accession No. ML18351A478). Total ISFSI obligation for Indian Point 1&2 is \$10.15M with \$8.46M attributable to Indian Point 2 and \$1.69M attributable to Indian Point 1 (totals may not foot due to rounding).

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding - Indian Point 1**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)**

Plant Name: **Indian Point Nuclear Generating Unit No. 1**

**10 CFR 50.82(a)(8)(v)**

- |  |   |
|--|---|
| 1. Cumulative decommissioning spending   | \$115.89million <sup>[Note 1]</sup>         |
| 2. 2018 decommissioning spending   | \$8.12million <sup>[Note 1]</sup>           |
| 3. Fund Balance  | See above in<br>10 CFR 50.75<br>information |
| 4. No other financial assurance mechanism is being relied upon, but costs through 12/31/2018 have been funded by operations, and not the decommissioning fund. |   |
| 5. Estimated costs to complete from latest estimate  | \$583.42million <sup>[Note 2]</sup>         |
| 6. Estimate is based on unrestricted release of the site per 10 CFR 20.1402  |   |
| 7. Modifications to financial assurance since last report  | See above in<br>10 CFR 50.75<br>information |
| 8. Any material changes to trust agreements  | See above in<br>10 CFR 50.75<br>information |

Note 1: Entergy Nuclear Operations, Inc. (Entergy) does not possess records that would permit determination of charges to Indian Point 1 (IP1) prior to its acquisition in September 2001 by Entergy Nuclear Indian Point 2, LLC. The costs presented here represent those costs charged in 2018 and the total costs that have been assigned to IP1 since 2001. Entergy has not fully determined what portion of those costs would be considered "decommissioning" costs as that term is defined in 10 CFR 50.2. Cumulative and 2018 decommissioning spending only consists of costs related to license termination.

Note 2: This amount is based upon total SAFSTOR expenditures for radiological remediation and license termination set forth in the updated Decommissioning Funding Assurance Plan and SAFSTOR analysis that are provided in Attachment 12 (Calculation of the NRC Minimum Amount is provided in Attachment 4). This estimate does not include 2018 spending because current costs are being paid out of operating funds.

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding - Indian Point 2**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

Plant Name: **Indian Point Nuclear Generating Unit No. 2**

- |   |   |
|---|---|
| 1. Minimum Financial Assurance (MFA)<br>estimated per 10 CFR 50.75(b) and (c) (2018\$)  | \$521.83 million <sup>[Note 1]</sup>                          |
| 2. ISFSI Obligation as of 12/31/18  | \$8.46million <sup>[Note 2]</sup>                             |
| 3. Decommissioning Trust Fund Total<br>as of 12/31/18   | \$598.41 million <sup>[Note 3]</sup>                          |
| 4. A schedule of the annual amounts remaining to be collected   | None  |
| 5. Assumptions used in determining rates of escalation in<br>decommissioning costs, rates of earnings on decommissioning<br>funds, and rates of other factors used in funding projections | 2% annual real rate<br>of return per<br>10 CFR 50.75(e)(1)(i) |
| 6. Any contracts upon which the licensee is relying pursuant to 10<br>CFR 50.75(e)(1)(v)  | None  |
| 7. Modifications occurring to a licensee's current method of providing<br>financial assurance since the last submitted report   | None  |
| 8. Any material changes to trust agreements   | None  |

Note 1: Calculation of the NRC Minimum Amount is provided in Attachment 4.

Note 2: From Entergy's Decommissioning Funding Plans (10 CFR 72.30) dated December 17, 2018 (Accession No. ML18351A478). Total ISFSI obligation for Indian Point 1&2 is \$10.15M with \$8.46M attributable to Indian Point 2 and \$1.69M attributable to Indian Point 1 (totals may not foot due to rounding).

Note 3: Includes provisional fund balance of \$33.16 million.

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding – Indian Point 3**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

Plant Name: **Indian Point Nuclear Generating Unit No. 3**

|   |   |
|---|---|
| 1. Minimum Financial Assurance (MFA)<br>estimated per 10 CFR 50.75(b) and (c) (2018\$)  | \$521.83 million <sup>[Note 1]</sup>                          |
| 2. ISFSI Obligation as of 12/31/18  | \$10.15 million <sup>[Note 2]</sup>                           |
| 3. Decommissioning Trust Fund Total<br>as of 12/31/18   | \$780.59 million  |
| 4. A schedule of the annual amounts remaining to be collected   | None  |
| 5. Assumptions used in determining rates of escalation in<br>decommissioning costs, rates of earnings on decommissioning<br>funds, and rates of other factors used in funding projections | 2% annual real rate<br>of return per<br>10 CFR 50.75(e)(1)(i) |
| 6. Any contracts upon which the licensee is relying pursuant to 10<br>CFR 50.75(e)(1)(v)  | None  |
| 7. Modifications occurring to a licensee's current method of providing<br>financial assurance since the last submitted report   | None  |
| 8. Any material changes to trust agreements   | None  |

Note 1: Calculation of the NRC Minimum Amount is provided in Attachment 4.

Note 2: From Entergy's ISFSI Decommissioning Funding Plans Pursuant to 10 CFR 72.30,  
December 17, 2018 (Accession No. ML18351A478)



**Entergy Nuclear Operations, Inc.**  
**Calculation of Minimum Amount – Indian Point**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

**Entergy Nuclear Indian Point 2, LLC:** 100% ownership interest of Indian Point 1 & 2

**Entergy Nuclear Indian Point 3, LLC:** 100% ownership interest of Indian Point 3

**Plant Location:** Buchanan, New York

**Reactor Type:** Pressurized Water Reactor ("PWR")

**Indian Point Unit 1 Power Level:** <3,400 MWt (615 MWt)

**Indian Point Unit 1 PWR Base Year 1986\$:** \$85,560,000

**Indian Point Unit 2 Power Level:** <3,400 MWt (3,216 MWt)

**Indian Point Unit 2 PWR Base Year 1986\$:** \$103,300,800

**Indian Point Unit 3 Power Level:** <3,400 MWt (3,216 MWt)

**Indian Point Unit 3 PWR Base Year 1986\$:** \$103,300,800

**Labor Region:** North

**Waste Burial Facility:** Generic Disposal Site

**10CFR50.75(c)(2) Escalation Factor Formula:**

$$0.65(L) + 0.13(E) + 0.22(B)$$

|                             | <u>Factor</u> |
|-----------------------------|---------------|
| L=Labor (North)             | $2.95^2$      |
| E=Energy (PWR)              | $2.37^3$      |
| B=Waste Burial-Vendor (PWR) | $12.853^4$    |

**PWR Escalation Factor:**

$$0.65(L) + 0.13(E) + 0.22(B) = 5.05160$$

**1986 PWR Base Year \$ Escalated:**

$$\text{Indian Point 1: } \$85,560,000 * \text{Factor} = \underline{\underline{\$432,214,534}}$$

$$\text{Indian Point 2 \& 3: } \$103,300,800 * \text{Factor} = \underline{\underline{\$521,833,884}}$$

<sup>2</sup> Bureau of Labor Statistics, Series Report ID: CIU2010000000210i (4<sup>th</sup> Quarter 2018)

<sup>3</sup> Bureau of Labor Statistics, Series Report ID: wpu0543 and wpu0573 (December 2018)

<sup>4</sup> Nuclear Regulatory Commission: NUREG-1307 Revision 17, Table 2.1 (2019)

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding Vermont Yankee**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)**

Plant Name: **Vermont Yankee Nuclear Power Station**

**10 CFR 50.75(f)(1)**

|   |   |
|---|---|
| 1. Minimum Financial Assurance (MFA)  | \$668.37 million <sup>[Note 1]</sup>                          |
| 2. ISFSI Obligation as of 12/31/18  | \$6.56 million <sup>[Note 2]</sup>                            |
| 3. Decommissioning Trust Fund Total<br>as of 12/31/18   | \$498.43 million  |
| 4. A schedule of the annual amounts remaining to be collected   | None  |
| 5. Assumptions used in determining rates of escalation in<br>decommissioning costs, rates of earnings on decommissioning<br>funds, and rates of other factors used in funding projections | 2% annual real rate<br>of return per<br>10 CFR 50.75(e)(1)(i) |
| 6. Any contracts upon which the licensee is relying pursuant to 10<br>CFR 50.75(e)(1)(v)  | None  |
| 7. Modifications occurring to a licensee's current method of<br>providing financial assurance since the last submitted report   | None  |
| 8. Any material changes to trust agreements   | None  |

Note 1: This amount is based upon total SAFSTOR expenditures for radiological remediation and license termination set forth in the updated Decommissioning Funding Assurance Plan and SAFSTOR analysis provided in Attachment 13. (Calculation of the NRC Minimum Amount is provided in Attachment 6).

Note 2: From Entergy's ISFSI Decommissioning Funding Plans Pursuant to 10 CFR 72.30, December 17, 2018 (Accession No. ML18351A478)

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding Vermont Yankee**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)**

Plant Name: **Vermont Yankee Nuclear Power Station**

**10 CFR 50.82(a)(8)(v)**

- |   |   |
|---|---|
| 1. Cumulative decommissioning spending through 12/31/2018                   | \$ 189.53 million <sup>[Note1]</sup>        |
| 2. 2018 decommissioning spending  | \$ 46.81 million <sup>[Note2]</sup>         |
| 3. Fund Balance   | See above in<br>10 CFR 50.75<br>information |
| 4. No other financial assurance mechanism is being relied upon.             |   |
| 5. Estimated costs to complete from latest estimate                         | \$ 668.37 million                           |
| 6. Estimate is based on unrestricted release of the site per 10 CFR 20.1402 |   |
| 7. Modifications to financial assurance since last report                   | See above in<br>10 CFR 50.75<br>information |
| 8. Any material changes to trust agreements                                 | See above in<br>10 CFR 50.75<br>information |

Note 1: Some decommissioning costs have been paid by the parent company, and not refunded from the decommissioning trust.

Note 2: This estimate only includes 2018 decommissioning costs. 2014 through 2017 qualified costs are included in item 1 and have been reimbursed in 2018.

**Entergy Nuclear Operations, Inc.**  
**Calculation of Minimum Amount - Vermont Yankee**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

**Entergy Nuclear Vermont Yankee LLC.:** 100% ownership interest  
**Plant Location:** Vernon, Vermont  
**Reactor Type:** Boiling Water Reactor ("BWR")  
**Power Level:** <3,400 MWt (1912 MWt)  
**BWR Base Year 1986\$:** \$121,208,000  
**Labor Region:** North  
**Waste Burial Facility:** Generic Disposal Site

**10CFR50.75(c)(2) Escalation Factor Formula:**

$$0.65(L) + 0.13(E) + 0.22(B)$$

|                             | <u>Factor</u>       |
|-----------------------------|---------------------|
| L=Labor (North)             | 2.95 <sup>1</sup>   |
| E=Energy (BWR)              | 2.39 <sup>2</sup>   |
| B=Waste Burial-Vendor (BWR) | 13.422 <sup>3</sup> |

**BWR Escalation Factor:**

$$0.65(L) + 0.13(E) + 0.22(B) = 5.18002$$

**1986 BWR Base Year \$ Escalated:**

$$\$121,208,000 * \text{Factor} = \$627,859,619$$

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<sup>1</sup> Bureau of Labor Statistics, Series Report ID: CIU2010000000210i (4<sup>th</sup> Quarter 2018)  
<sup>2</sup> Bureau of Labor Statistics, Series Report ID: wpu0543 and wpu0573 (December 2018)  
<sup>3</sup> Nuclear Regulatory Commission: NUREG-1307 Revision 17, Table 2.1 (2019)

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding - Pilgrim**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)**

Plant Name: **Pilgrim Nuclear Power Station**

|   |  |
|---|--|
| 1. Minimum Financial Assurance (MFA)  | \$1,188.0 million <sup>[Note 1]</sup>                      |
| 2. ISFSI Obligation as of 12/31/18  | \$9.42 million <sup>[Note 2]</sup>                         |
| 3. Decommissioning Trust Fund Total<br>as of 12/31/18   | \$1,027.7 million  |
| as of 02/28/19  | \$1,043.4 million  |
| 4. A schedule of the annual amounts remaining to be collected   | None   |
| 5. Assumptions used in determining rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections | 2% annual real rate of return per<br>10 CFR 50.75(e)(1)(i) |
| 6. Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v)   | None   |
| 7. Modifications occurring to a licensee's current method of providing financial assurance since the last submitted report  | None   |
| 8. Any material changes to trust agreements   | None   |

Note 1: This amount is based upon total SAFSTOR expenditures for radiological remediation and license termination set forth in the updated Decommissioning Funding Assurance Plan and SAFSTOR analysis provided in Attachment 14 (Calculation of the NRC Minimum Amount is provided in Attachment 8).

Note 2: From Entergy's ISFSI Decommissioning Funding Plans Pursuant to 10 CFR 72.30, December 17, 2018 (Accession No. ML18351A478)

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding - Pilgrim**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)**

Plant Name: **Pilgrim Nuclear Power Station**

**10 CFR 50.82(a)(8)(v)**

- |   |   |
|---|---|
| 1. Cumulative decommissioning spending through 12/31/2018                   | \$ 8.25 million <sup>[Note 1]</sup>         |
| 2. 2018 decommissioning spending  | \$ 5.99 million                             |
| 3. Fund Balance   | See above in 10<br>CFR 50.75<br>information |
| 4. No other financial assurance mechanism is being relied upon.             |   |
| 5. Estimated costs to complete from latest estimate                         | \$ 1,188.0 million                          |
| 6. Estimate is based on unrestricted release of the site per 10 CFR 20.1402 |   |
| 7. Modifications to financial assurance since last report                   | See above in<br>10 CFR 50.75<br>information |
| 8. Any material changes to trust agreements                                 | See above in<br>10 CFR 50.75<br>information |

Note 1: Some decommissioning costs have been paid by the parent company, and not refunded from the decommissioning trust.

**Entergy Nuclear Operations, Inc.  
Status of Decommissioning Funding - Pilgrim  
For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

**Entergy Nuclear Generation Co.:** 100% ownership interest  
**Plant Location:** Plymouth, Massachusetts  
**Reactor Type:** Boiling Water Reactor ("BWR")  
**Power Level:** <3,400 MWt (2028 MWt)  
**BWR Base Year 1986\$:** \$122,252,000  
**Labor Region:** North  
**Waste Burial Facility:** Generic Disposal Site

**10CFR50.75(c)(2) Escalation Factor Formula:**

$$0.65(L) + 0.13(E) + 0.22(B)$$

|                             | <u>Factor</u>       |
|-----------------------------|---------------------|
| L=Labor (North)             | 2.95 <sup>1</sup>   |
| E=Energy (BWR)              | 2.39 <sup>2</sup>   |
| B=Waste Burial-Vendor (BWR) | 13.422 <sup>3</sup> |

**BWR Escalation Factor:**

$$0.65(L) + 0.13(E) + 0.22(B) = 5.18002$$

**1986 BWR Base Year \$ Escalated:**

$$\$122,252,000 * \text{Factor} = \$633,267,558$$

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<sup>1</sup> Bureau of Labor Statistics, Series Report ID: CIU2010000000210i (4<sup>th</sup> Quarter 2018)  
<sup>2</sup> Bureau of Labor Statistics, Series Report ID: wpu0543 and wpu0573 (December 2018)  
<sup>3</sup> Nuclear Regulatory Commission: NUREG-1307 Revision 17, Table 2.1 (2019)

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding – Palisades**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

Plant Name: **Palisades Nuclear Plant**

|   |   |
|---|---|
| 1. Minimum Financial Assurance (MFA) estimated per 10 CFR 50.75(b) and (c) (2018\$)   | \$480.43 million <sup>[Note 1]</sup>                    |
| 2. ISFSI Obligation as of 12/31/18  | \$8.00 million <sup>[Note 2]</sup>                      |
| 3. Decommissioning Trust Fund Total as of 12/31/18  | \$443.63 million  |
| 4. A schedule of the annual amounts remaining to be collected   | None  |
| 5. Assumptions used in determining rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections | 2% annual real rate of return per 10 CFR 50.75(e)(1)(i) |
| 6. Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v)   | None  |
| 7. Modifications occurring to a licensee's current method of providing financial assurance since the last submitted report  | None  |
| 8. Any material changes to trust agreements   | None  |

Note 1: Calculation of the NRC Minimum Amount is provided in Attachment 10

Note 2: From Entergy's ISFSI Decommissioning Funding Plans Pursuant to 10 CFR 72.30, December 17, 2018 (Accession No. ML18351A478)



**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding – Palisades**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

**Entergy Nuclear Palisades LLC.:** 100% ownership interest

**Plant Location:** Covert, Michigan

**Reactor Type:** Pressure Water Reactor ("PWR")

**Power Level:** <3,400 MWt (2565 MWt)

**PWR Base Year 1986\$:** \$97,572,000

**Labor Region:** Midwest

**Waste Burial Facility:** Generic Disposal Site

**10CFR50.75(c)(2) Escalation Factor Formula:**

$$0.65(L) + 0.13(E) + 0.22(B)$$

|                             | <u>Factor</u>       |
|-----------------------------|---------------------|
| L=Labor (Midwest)           | 2.75 <sup>1</sup>   |
| E=Energy (PWR)              | 2.37 <sup>2</sup>   |
| B=Waste Burial-Vendor (PWR) | 12.853 <sup>3</sup> |

**PWR Escalation Factor:**

$$0.65(L) + 0.13(E) + 0.22(B) = 4.92383$$

**1986 PWR Base Year \$ Escalated:**

$$\$97,572,000 * \text{Factor} = \$480,428,114$$

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<sup>1</sup> Bureau of Labor Statistics, Series Report ID: CIU2010000000230i (4<sup>th</sup> Quarter 2018)  
<sup>2</sup> Bureau of Labor Statistics, Series Report ID: wpu0543 and wpu0573 (December 2018)  
<sup>3</sup> Nuclear Regulatory Commission: NUREG-1307 Revision 17, Table 2.1 (2019)

**Entergy Nuclear Operations, Inc.**  
**Status of Decommissioning Funding – Big Rock Point**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

Plant Name: **Big Rock Point ISFSI**

- |   |  |
|---|--|
| 1. Amount of decommissioning funds required from most recent estimate (2018\$).   | \$2.57 million <sup>[Note 1]</sup>             |
| 2. Decommissioning Funding Assurance Method.  | Parent Guarantee (\$5 million)                 |
| 3. A schedule of the annual amounts remaining to be collected   | None   |
| 4. Assumptions used in determining rates of escalation in decommissioning costs, rates of earnings on decommissioning funds, and rates of other factors used in funding projections | Escalation rate: CPIU<br>Rate of earnings: n/a |
| 5. Any contracts upon which the licensee is relying pursuant to 10 CFR 50.75(e)(1)(v)   | None   |
| 6. Modifications occurring to a licensee's current method of providing financial assurance since the last submitted report  | None   |
| 7. Any material changes to trust agreements   | None   |

Note 1: From Entergy's ISFSI Decommissioning Funding Plans Pursuant to 10 CFR 72.30, December 17, 2018 (Accession No. ML18351A478), escalated for inflation.

**Entergy Nuclear Operations, Inc.**  
**IP1 DTF Balance Based on Decommissioning Funding Assurance Plan**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

On October 23, 2008, Entergy Nuclear Indian Point 2, LLC (ENIP2) submitted a preliminary decommissioning cost analysis to the NRC in conjunction with its spent fuel management plan under 10 CFR 50.75(f)(3) and 10 CFR 50.54(bb) (Accession No. ML083040378, as supplemented by ENIP2's reply to RAIs on July 15, 2009 (Accession No. ML092050204)). The preliminary decommissioning cost analysis contained separate site-specific decommissioning cost estimates for Indian Point 1 and Indian Point 2. The estimates were subsequently found to be reasonable by the NRC on March 17, 2010 (Accession No. ML100280544).

Pursuant to Regulatory Guide 1.159, Revision 2, adjustment to the site-specific cost estimates should be made at least once a year for the effects of inflation. Adjustment to site-specific cost estimates for the effects of technological and status changes should be made according to the amount of change experienced, as appropriate, but in no event, less than once every 5 years. As such, ENIP2 has updated the aforementioned estimates consistent with the requirements of Regulatory Guide 1.159, Revision 2.

ENIP2 has determined that use of a SAFSTOR analysis shows that there is presently reasonable assurance that adequate funds will be available for the decommissioning process in compliance with NRC decommissioning funding assurance rules.

Pursuant to 10 CFR 50.75(e)(1)(i), "A licensee that has prepaid funds based on a site-specific estimate under § 50.75(b)(1) of this section may take credit for projected earnings on the prepaid decommissioning trust funds, using up to a 2 percent annual real rate of return from the time of future funds' collection through the projected decommissioning period, provided that the site-specific estimate is based on a period of safe storage that is specifically described in the estimate." ENIP2 understands that a facility-specific analysis may be used for demonstrating the adequacy of decommissioning funds, provided that "the NRC-required cost estimate for decommissioning costs as defined in 10 CFR 50.2 is equal to or greater than the amount stated in the formulas in 10 CFR 50.75(c)(1) and (2) as the basis for justifying a higher than minimum funding level." (Regulatory Guide 1.159 Rev. 2, Section 1.1.1) ENIP2 also understands that NRC should be provided the analysis, and that the analysis should include data for each year of the analysis.

The updated Indian Point 1 site-specific decommissioning cost estimate is based on a period of safe storage that is specifically described in the estimate, namely storage until 2073, at which time the plant decommissioning will be completed and the site released for alternative use without restriction. Table 12-1 below provides the annual license termination costs computed in the updated estimate. These costs to date have been funded by operations, and not by the decommissioning fund. The decommissioning trust fund (DTF) ending balance is escalated each year by the 2% real growth figure allowed pursuant to 10 CFR 50.75(e)(1)(i).

**Entergy Nuclear Operations, Inc.**  
**IP1 DTF Balance Based on Decommissioning Funding Assurance Plan**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

| Table 12-1                                    |                                |                       |
|---|--------------------------------|-----------------------|
| NRC License Termination Cost<br>(\$ millions) |                                |                       |
|   | 2018 \$ Unit 1<br>Radiological | Ending DTF<br>Balance |
|   |                                |                       |
| 2019  | 1.029                          | 479.599               |
| 2020  | 4.127                          | 485.063               |
| 2021  | 4.116                          | 490.649               |
| 2022  | 4.116                          | 496.346               |
| 2023  | 4.116                          | 502.157               |
| 2024  | 4.127                          | 508.073               |
| 2025  | 4.116                          | 514.119               |
| 2026  | 4.116                          | 520.285               |
| 2027  | 4.116                          | 526.575               |
| 2028  | 4.127                          | 532.980               |
| 2029  | 4.116                          | 539.523               |
| 2030  | 4.116                          | 546.198               |
| 2031  | 4.116                          | 553.006               |
| 2032  | 4.127                          | 559.939               |
| 2033  | 4.116                          | 567.022               |
| 2034  | 4.116                          | 574.247               |
| 2035  | 4.116                          | 581.616               |
| 2036  | 4.127                          | 589.121               |
| 2037  | 4.116                          | 596.788               |
| 2038  | 4.116                          | 604.607               |
| 2039  | 4.116                          | 612.584               |
| 2040  | 4.127                          | 620.708               |
| 2041  | 4.116                          | 629.007               |
| 2042  | 4.116                          | 637.471               |
| 2043  | 4.116                          | 646.105               |
| 2044  | 4.127                          | 654.900               |
| 2045  | 4.116                          | 663.882               |
| 2046  | 4.116                          | 673.043               |
| 2047  | 4.116                          | 682.389               |
| 2048  | 4.127                          | 691.909               |
| 2049  | 4.116                          | 701.632               |
| 2050  | 4.116                          | 711.548               |
| 2051  | 4.116                          | 721.663               |
| 2052  | 4.127                          | 731.970               |
| 2053  | 4.116                          | 742.493               |
| 2054  | 4.116                          | 753.227               |
| 2055  | 4.116                          | 764.176               |

**Entergy Nuclear Operations, Inc.**  
**IP1 DTF Balance Based on Decommissioning Funding Assurance Plan**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

| Table 12-1                                    |                                |                       |
|---|--------------------------------|-----------------------|
| NRC License Termination Cost<br>(\$ millions) |                                |                       |
|   | 2018 \$ Unit 1<br>Radiological | Ending DTF<br>Balance |
| 2056  | 4.127                          | 775.332               |
| 2057  | 4.116                          | 786.723               |
| 2058  | 4.116                          | 798.342               |
| 2059  | 4.116                          | 810.193               |
| 2060  | 4.127                          | 822.270               |
| 2061  | 4.116                          | 834.599               |
| 2062  | 4.116                          | 847.175               |
| 2063  | 4.116                          | 860.003               |
| 2064  | 4.127                          | 873.076               |
| 2065  | 30.136                         | 860.401               |
| 2066  | 65.661                         | 811.949               |
| 2067  | 109.504                        | 718.684               |
| 2068  | 116.483                        | 616.574               |
| 2069  | 16.838                         | 612.068               |
| 2070  | 16.711                         | 607.598               |
| 2071  | 16.711                         | 603.039               |
| 2072  | 16.757                         | 598.343               |
| 2073  | 8.241                          | 602.069               |
|   |                                |                       |
| Total   | 583.418                        |                       |
|   |                                |                       |

**Entergy Nuclear Operations, Inc.**  
**IP1 DTF Balance Based on Decommissioning Funding Assurance Plan**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

As can be seen from the information provided in Table 12-1, the required funding for SAFSTOR decommissioning, \$583.42 million, is greater than the NRC formula amount per 10 CFR 50.75(b) and (c) of \$432.21 million, therefore, the site-specific analysis complies with the requirement from Regulatory Guide 1.159 section 1.1.1 previously discussed. The foregoing SAFSTOR analysis shows that when the December 31, 2018 DTF balance is escalated at the allowable rate and compared against the annual figures for the SAFSTOR period, that an approximately \$602.07 million surplus exists at the end of the decommissioning project. The present value of this surplus is \$206.7 million in 2019 dollars ( $\$602.07 \text{ million} / (1.02)^{(2073-2019)}$ ). This surplus is sufficient to cover the spent fuel management costs for Indian Point 1 as reflected in Reference 1, Attachment 1, of approximately \$55 million, as well as ISFSI decommissioning costs shown in Attachment 1 from this filing, if not paid for by spent fuel litigation proceeds. Accordingly, ENIP2 concludes that no further action is required at this time to demonstrate adequate funding assurance for decommissioning Indian Point 1.

Reference 1: Letter, Status of Funding for Managing Irradiated Fuel For Year Ending December 31, 2018 – 10 CFR 50.82(a)(8)(vii), CNRO-2019-00006, filed March 2019.

**Entergy Nuclear Operations, Inc.**  
**Vermont Yankee Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

Vermont Yankee Nuclear Power Station (Vermont Yankee) permanently ceased operations on December 29, 2014. In January 2019, Entergy Nuclear Vermont Yankee, LLC was acquired by NorthStar Nuclear Decommissioning Company, LLC, and after the acquisition, Entergy Nuclear Operations, Inc. (ENOI) was no longer the Licensee for Vermont Yankee. ENOI is submitting this report pertaining to Vermont Yankee because as of December 31, 2018, ENOI was the Licensee for the plant. Following the acquisition, ENOI is no longer responsible for Vermont Yankee decommissioning plans.

The Vermont Yankee decommissioning trust fund balance was approximately \$498.4 million as of December 31, 2018. Tables 3.4 and 3.5 of the site-specific decommissioning cost estimate (Reference 1, Enclosure) set forth the estimated annual expenditures for license termination and spent fuel management, respectively. Subsequent to the filing of Reference 1, two significant schedule changes were submitted to reflect the accelerated completion of the dry fuel loading campaign (Reference 2) and preparations for dismantling and decontamination occurring in 2017-2018 versus 2068-2069 (Reference 3). A cash flow analysis utilizing this annual expenditure and significant schedule change information is included as Table 13-1.

The cash flow analysis demonstrates that the Vermont Yankee decommissioning trust fund was sufficiently funded for all license termination activities and certain spent fuel management activities (i.e., operational costs) as of December 31, 2018. As discussed in the Irradiated Fuel Management Program Update (Reference 4) costs related to spent fuel management operations (e.g., operations and maintenance costs for the spent fuel pool and Independent Spent Fuel Storage Installation, totaling approximately \$148 million, Table 13-1 Column 2, minus Column 3 amounts funded by external credit facilities) were planned to be funded from the decommissioning trust fund. This information also reflects the significant schedule change submitted for completion of the dry fuel storage campaign in 2018 (Reference 2). ENOI obtained an exemption that allows the use of trust funds for spent fuel management activities (Reference 5).

ENOI has determined that use of a SAFSTOR analysis shows that as of December 31, 2019 there was reasonable assurance that adequate funds will be available for the decommissioning process in compliance with NRC decommissioning funding assurance rules.

Pursuant to 10 CFR 50.75(e)(1)(i), "A licensee that has prepaid funds based on a site-specific estimate under § 50.75(b)(1) of this section may take credit for projected earnings on the prepaid decommissioning trust funds, using up to a 2 percent annual real rate of return from the time of future funds' collection through the projected decommissioning period, provided that the site-specific estimate is based on a period of safe storage that is specifically described in the estimate." ENOI understands that a facility-specific analysis may be used for demonstrating the adequacy of decommissioning funds, provided that "the NRC-required cost estimate for decommissioning costs as defined in 10 CFR 50.2 is equal to or greater than the amount stated in the formulas in 10 CFR 50.75(c)(1) and (2) as the basis for justifying a higher than minimum funding level." (Regulatory Guide 1.159 Rev. 2, Section 1.1.1.) ENOI also understands that NRC should be provided the analysis, and that the analysis should include data for each year of the analysis. An updated decommissioning estimate was provided with the licensee's Post Shutdown Decommissioning Activities Report on December 19, 2014 (Reference 1).

**Entergy Nuclear Operations, Inc.**  
**Vermont Yankee Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

The updated Vermont Yankee site-specific decommissioning cost estimate is based on a period of safe storage that is specifically described in the estimate, namely storage until approximately 2075, at which time the plant decommissioning will be completed and the site released for alternative use without restriction. Table 13-1 below provides the annual license termination and spent fuel management costs computed in the updated estimate. The decommissioning trust fund (DTF) ending balance is escalated each year by the 2% real growth figure allowed pursuant to 10 CFR 50.75(e)(1)(i).

Thus, considering the fund balance of \$498.4 million, as of December 31, 2018, and projected fund earnings during the SAFSTOR period (assuming an annual 2% growth rate), the trust fund was expected to have an excess of \$276.0 million after completion of license termination and the operational spent fuel management activities that will be funded by the trust fund.

REFERENCES:

1. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Post Shutdown Decommissioning Activities Report," BNY 14-078, dated December 19, 2014 (Accession No. ML14357A110).
2. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Notification of Schedule Change for Dry Fuel Loading Campaign," BNY 17-013, dated April 12, 2017 (Accession No. ML17104A050).
3. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Notification of Schedule Change for Preparations for Dismantling and Decontamination," BNY 17-028, dated August 28, 2017 (Accession No. ML17248A468).
4. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Update to Irradiated Fuel Management Program Pursuant to 10 CFR 50.54(bb)," BNY 14-085, dated December 19, 2014 (Accession No. ML14358A251).
5. NRC Approval of Exemption Request for Spent Fuel Management, 80 Fed. Reg. 35992 (June 23, 2015).



**Entergy Nuclear Operations, Inc.**  
**Vermont Yankee Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

| Table 13-1   |  |   |  |   |  |                                   |                                     |  |   |
|--|--|---|--|---|--|-----------------------------------|-------------------------------------|--|---|
| Vermont Yankee Nuclear Power Station - SAFSTOR Methodology                                       |  |   |  |   |  |                                   |                                     |  |   |
| Annual Cash Flow Analysis - Total License Termination, Spent Fuel Management less Dry Fuel Costs |  |   |  |   |  |                                   |                                     |  |   |
| (In Thousands in 2018 Dollars) (see column definitions below)                                    |  |   |  |   |  |                                   |                                     |  |   |
| Year   | Column 1<br>50.75<br>License<br>Termination<br>Cost<br>(\$000's) | Column 2<br>50.54 (bb)<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | Column 3<br>Exclude<br>Dry Fuel<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | Column 4<br>License<br>Termination<br>Cost plus<br>Spent Fuel<br>Management<br>Cost less<br>Dry Fuel<br>Cost<br>(\$000's) | Column 5<br>Beginning<br>of Year<br>Trust Fund<br>Balance<br>(\$000's) | Column 6<br>Withdraw<br>(\$000's) | Column 7<br>Contribute<br>(\$000's) | Column 8<br>Trust<br>Fund<br>Earnings<br>(\$000's) | Column 9<br>Year<br>Ending<br>Trust<br>Fund<br>Balance<br>(\$000's) |
| 2019   | 5,727  | 4,356   | 0  | 10,083  | 498,432  | 10,083                            | 0                                   | 9,767  | 498,116   |
| 2020   | 5,672  | 4,356   |  | 10,028  | 498,116  | 10,028                            | 0                                   | 9,762  | 497,850   |
| 2021   | 5,672  | 4,356   |  | 10,028  | 497,850  | 10,028                            | 0                                   | 9,756  | 497,578   |
| 2022   | 3,963  | 4,356   |  | 8,319   | 497,578  | 8,319                             | 0                                   | 9,785  | 499,045   |
| 2023   | 3,963  | 4,356   |  | 8,319   | 499,045  | 8,319                             | 0                                   | 9,815  | 500,541   |
| 2024   | 3,963  | 4,368   |  | 8,331   | 500,541  | 8,331                             | 0                                   | 9,844  | 502,054   |
| 2025   | 3,898  | 4,356   |  | 8,254   | 502,054  | 8,254                             | 0                                   | 9,876  | 503,677   |
| 2026   | 4,055  | 4,356   |  | 8,411   | 503,677  | 8,411                             | 0                                   | 9,905  | 505,171   |
| 2027   | 4,110  | 4,356   |  | 8,466   | 505,171  | 8,466                             | 0                                   | 9,934  | 506,639   |
| 2028   | 4,064  | 4,368   |  | 8,432   | 506,639  | 8,432                             | 0                                   | 9,964  | 508,171   |
| 2029   | 4,055  | 4,356   |  | 8,411   | 508,171  | 8,411                             | 0                                   | 9,995  | 509,755   |
| 2030   | 4,110  | 4,356   |  | 8,466   | 509,755  | 8,466                             | 0                                   | 10,026   | 511,314   |
| 2031   | 4,055  | 4,356   |  | 8,411   | 511,314  | 8,411                             | 0                                   | 10,058   | 512,961   |
| 2032   | 4,064  | 4,368   |  | 8,432   | 512,961  | 8,432                             | 0                                   | 10,091   | 514,619   |
| 2033   | 4,110  | 4,356   |  | 8,466   | 514,619  | 8,466                             | 0                                   | 10,123   | 516,276   |
| 2034   | 4,055  | 4,356   |  | 8,411   | 516,276  | 8,411                             | 0                                   | 10,157   | 518,022   |
| 2035   | 4,055  | 4,356   |  | 8,411   | 518,022  | 8,411                             | 0                                   | 10,192   | 519,804   |
| 2036   | 4,120  | 4,368   |  | 8,488   | 519,804  | 8,488                             | 0                                   | 10,226   | 521,542   |
| 2037   | 4,055  | 4,356   |  | 8,411   | 521,542  | 8,411                             | 0                                   | 10,263   | 523,394   |
| 2038   | 4,055  | 4,356   |  | 8,411   | 523,394  | 8,411                             | 0                                   | 10,300   | 525,283   |
| 2039   | 4,110  | 4,356   |  | 8,466   | 525,283  | 8,466                             | 0                                   | 10,336   | 527,152   |
| 2040   | 4,064  | 4,368   |  | 8,432   | 527,152  | 8,432                             | 0                                   | 10,374   | 529,094   |
| 2041   | 4,055  | 4,356   |  | 8,411   | 529,094  | 8,411                             | 0                                   | 10,414   | 531,097   |
| 2042   | 4,110  | 4,356   |  | 8,466   | 531,097  | 8,466                             | 0                                   | 10,453   | 533,083   |
| 2043   | 4,055  | 4,356   |  | 8,411   | 533,083  | 8,411                             | 0                                   | 10,493   | 535,166   |
| 2044   | 4,064  | 4,368   |  | 8,432   | 535,166  | 8,432                             | 0                                   | 10,535   | 537,268   |

**Entergy Nuclear Operations, Inc.**  
**Vermont Yankee Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

| Table 13-1   |  |   |  |   |  |                                   |                                     |  |   |
|--|--|---|--|---|--|-----------------------------------|-------------------------------------|--|---|
| Vermont Yankee Nuclear Power Station - SAFSTOR Methodology                                       |  |   |  |   |  |                                   |                                     |  |   |
| Annual Cash Flow Analysis - Total License Termination, Spent Fuel Management less Dry Fuel Costs |  |   |  |   |  |                                   |                                     |  |   |
| (In Thousands in 2018 Dollars) (see column definitions below)                                    |  |   |  |   |  |                                   |                                     |  |   |
| Year   | Column 1<br>50.75<br>License<br>Termination<br>Cost<br>(\$000's) | Column 2<br>50.54 (bb)<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | Column 3<br>Exclude<br>Dry Fuel<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | Column 4<br>License<br>Termination<br>Cost plus<br>Spent Fuel<br>Management<br>Cost less<br>Dry Fuel<br>Cost<br>(\$000's) | Column 5<br>Beginning<br>of Year<br>Trust Fund<br>Balance<br>(\$000's) | Column 6<br>Withdraw<br>(\$000's) | Column 7<br>Contribute<br>(\$000's) | Column 8<br>Trust<br>Fund<br>Earnings<br>(\$000's) | Column 9<br>Year<br>Ending<br>Trust<br>Fund<br>Balance<br>(\$000's) |
| 2045   | 4,110  | 4,356   |  | 8,466   | 537,268  | 8,466                             | 0                                   | 10,576   | 539,378   |
| 2046   | 4,055  | 4,356   |  | 8,411   | 539,378  | 8,411                             | 0                                   | 10,619   | 541,586   |
| 2047   | 4,055  | 4,356   |  | 8,411   | 541,586  | 8,411                             | 0                                   | 10,664   | 543,839   |
| 2048   | 4,120  | 4,368   |  | 8,488   | 543,839  | 8,488                             | 0                                   | 10,707   | 546,058   |
| 2049   | 4,055  | 4,356   |  | 8,411   | 546,058  | 8,411                             | 0                                   | 10,753   | 548,400   |
| 2050   | 4,055  | 4,356   |  | 8,411   | 548,400  | 8,411                             | 0                                   | 10,800   | 550,789   |
| 2051   | 4,110  | 4,356   |  | 8,466   | 550,789  | 8,466                             | 0                                   | 10,846   | 553,169   |
| 2052   | 4,064  | 4,368   |  | 8,432   | 553,169  | 8,432                             | 0                                   | 10,895   | 555,631   |
| 2053   | 3,889  | 0   |  | 3,889   | 555,631  | 3,889                             | 0                                   | 11,035   | 562,777   |
| 2054   | 3,944  | 0   |  | 3,944   | 562,777  | 3,944                             | 0                                   | 11,177   | 570,009   |
| 2055   | 3,889  | 0   |  | 3,889   | 570,009  | 3,889                             | 0                                   | 11,322   | 577,443   |
| 2056   | 3,898  | 0   |  | 3,898   | 577,443  | 3,898                             | 0                                   | 11,471   | 585,015   |
| 2057   | 3,944  | 0   |  | 3,944   | 585,015  | 3,944                             | 0                                   | 11,621   | 592,692   |
| 2058   | 3,889  | 0   |  | 3,889   | 592,692  | 3,889                             | 0                                   | 11,776   | 600,579   |
| 2059   | 3,889  | 0   |  | 3,889   | 600,579  | 3,889                             | 0                                   | 11,934   | 608,624   |
| 2060   | 3,954  | 0   |  | 3,954   | 608,624  | 3,954                             | 0                                   | 12,093   | 616,763   |
| 2061   | 3,889  | 0   |  | 3,889   | 616,763  | 3,889                             | 0                                   | 12,257   | 625,132   |
| 2062   | 3,889  | 0   |  | 3,889   | 625,132  | 3,889                             | 0                                   | 12,425   | 633,668   |
| 2063   | 3,944  | 0   |  | 3,944   | 633,668  | 3,944                             | 0                                   | 12,594   | 642,318   |
| 2064   | 3,898  | 0   |  | 3,898   | 642,318  | 3,898                             | 0                                   | 12,768   | 651,188   |
| 2065   | 3,889  | 0   |  | 3,889   | 651,188  | 3,889                             | 0                                   | 12,946   | 660,245   |
| 2066   | 3,944  | 0   |  | 3,944   | 660,245  | 3,944                             | 0                                   | 13,126   | 669,427   |
| 2067   | 3,889  | 0   |  | 3,889   | 669,427  | 3,889                             | 0                                   | 13,311   | 678,848   |
| 2068   | 35,546   | 0   |  | 35,546  | 678,848  | 35,546                            | 0                                   | 12,866   | 656,169   |
| 2069   | 78,735   | 0   |  | 78,735  | 656,169  | 78,735                            | 0                                   | 11,549   | 588,982   |
| 2070   | 112,853  | 0   |  | 112,853   | 588,982  | 112,853                           | 0                                   | 9,523  | 485,652   |
| 2071   | 91,796   | 0   |  | 91,796  | 485,652  | 91,796                            | 0                                   | 7,877  | 401,732   |
| 2072   | 92,267   | 0   |  | 92,267  | 401,732  | 92,267                            | 0                                   | 6,189  | 315,655   |

**Entergy Nuclear Operations, Inc.**  
**Vermont Yankee Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

| Table 13-1   |   |  |   |  |   |  |  |   |  |
|--|---|--|---|--|---|--|--|---|--|
| Vermont Yankee Nuclear Power Station - SAFSTOR Methodology                                       |   |  |   |  |   |  |  |   |  |
| Annual Cash Flow Analysis - Total License Termination, Spent Fuel Management less Dry Fuel Costs |   |  |   |  |   |  |  |   |  |
| (In Thousands in 2018 Dollars) (see column definitions below)                                    |   |  |   |  |   |  |  |   |  |
| Year   | <u>Column 1</u><br>50.75<br>License<br>Termination<br>Cost<br>(\$000's) | <u>Column 2</u><br>50.54 (bb)<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | <u>Column 3</u><br>Exclude<br>Dry Fuel<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | <u>Column 4</u><br>License<br>Termination<br>Cost plus<br>Spent Fuel<br>Management<br>Cost less<br>Dry Fuel<br>Cost<br>(\$000's) | <u>Column 5</u><br>Beginning<br>of Year<br>Trust Fund<br>Balance<br>(\$000's) | <u>Column 6</u><br>Withdraw<br>(\$000's) | <u>Column 7</u><br>Contribute<br>(\$000's) | <u>Column 8</u><br>Trust<br>Fund<br>Earnings<br>(\$000's) | <u>Column 9</u><br>Year<br>Ending<br>Trust<br>Fund<br>Balance<br>(\$000's) |
| 2073   | 54,739  | 0  |   | 54,739   | 315,655   | 54,739                                   | 0  | 5,218   | 266,134  |
| 2074   | 566   | 0  |   | 566  | 266,134   | 566                                      | 0  | 5,311   | 270,879  |
| 2075   | 327   | 0  |   | 327  | 270,879   | 327                                      | 0  | 5,411   | 275,963  |
|  |   |  |   |  |   |  |  |   |  |
|  | 668,374   | 148,201  | 0   | 816,575  |   | 816,575                                  | 0  | 594,106   | 275,963  |

As can be seen from the information provided in Table 13-1, the required funding for SAFSTOR decommissioning, \$668.37 million, is greater than the NRC formula amount per 10 CFR 50.75(b) and (c) of \$627.86 million, therefore, the site-specific analysis complies with the requirement from Regulatory Guide 1.159 section 1.1.1 previously discussed. The foregoing SAFSTOR analysis shows that when the December 31, 2018 DTF balance is escalated at the allowable rate and compared against the annual figures for the SAFSTOR period, that an approximately \$275.96 million surplus exists at the end of the decommissioning project. ISFSI decommissioning costs were planned to be paid for out of the aforementioned excess funds if not paid for by spent fuel litigation proceeds. Accordingly, the ENOI concludes that no further action is required as of December 31, 2018 to demonstrate adequate funding assurance for decommissioning Vermont Yankee.

**Entergy Nuclear Operations, Inc.  
Vermont Yankee Annual Cash Flow Analysis  
For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

**Table 13-1 Definitions:**

**Column 1: 50.75 License Termination Cost**

Reflects the Total Annual License Termination Plan cost in 2018 dollars at a 0.0% escalation rate

**Column 2: 50.54 (bb) Spent Fuel Management Cost**

Reflects the Total Annual Irradiated Fuel Management Plan cost in 2018 dollars at a 0.0% escalation rate

**Column 3: Exclude Transfer to Dry Fuel Storage Cost**

Reflects the Transfer to Dry Fuel Storage Cost included in Column 2 that is planned to be funded by external credit facilities, in 2018 dollars at a 0.0% escalation rate

**Column 4: License Termination Cost plus Spent Fuel Management Cost less Transfer to Dry Fuel Storage Cost**

Reflects the Total Annual License Termination Plan cost plus Total Spent Fuel Management Plan cost less Transfer to Dry Fuel Storage cost all in 2018 dollars at a 0.0% escalation rate (Column 1 + Column 2 - Column 3)

**Column 5: Beginning of Year Trust Fund Balance**

Reflects the beginning of year Trust Fund balance in 2018 dollars at a 0.0% escalation rate and 2.0% Fund Earnings

**Column 6: Withdraw**

Reflects the annual expenditures from the Trust Fund in 2018 dollars at a 0.0% escalation rate (equals Column 4)

**Column 7: Contribute**

Reflects the annual contributions to the Trust Fund in 2018 dollars at a 0.0% escalation rate

**Entergy Nuclear Operations, Inc.**  
**Vermont Yankee Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

**Column 8:    Trust Fund Earnings**

Reflects earnings on funds remaining in the trust. A 2.0% Earnings rate is used over a 0.0% cost escalation rate. The Annual 2.0% earnings are calculated on the beginning balance less 100% of the projected annual expenditure for each year.  $(\text{Column 5} - 100\% \text{ of Column 6}) * 2.0\%$

**Column 9:    Year Ending Trust Fund Balance**

Reflects the end of year Trust Fund balance after all projected earnings are added and all projected expenditures are deducted specified at a 0.0% escalation rate and 2.0% Fund Earnings in 2018 dollars.  $(\text{Column 5} - \text{Column 6} + \text{Column 7} + \text{Column 8})$

**Entergy Nuclear Operations, Inc.**  
**Pilgrim Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

Pilgrim Nuclear Power Station (Pilgrim) will permanently cease operations on May 31, 2019. The Pilgrim decommissioning trust fund balance is approximately \$1,028 million as of December 31, 2018. Tables 3.2a and 3.2b of the site-specific decommissioning cost estimate (Reference 1, Attachment 1) set forth the estimated annual expenditures for license termination and spent fuel management, respectively. A cash flow analysis utilizing this annual expenditure and significant schedule change information is included as Table 14-1 below.

The cash flow analysis demonstrates that the Pilgrim decommissioning trust fund is sufficiently funded for all license termination activities and spent fuel management activities (i.e., operational costs). As discussed in the Irradiated Fuel Management Program Update (Reference 2) costs related to spent fuel management operations (e.g., operations and maintenance costs for the spent fuel pool and Independent Spent Fuel Storage Installation, totaling approximately \$420 million, Table 14-1 Column 2) will be funded from the decommissioning trust fund. Entergy Nuclear Operations, Inc. understands that an exemption from 10 CFR 50.82(a)(8)(i)(A) must be granted prior to reimbursing any spent fuel management-related expenses from the Pilgrim decommissioning trust. A request for such an exemption was submitted as Reference 3.

The licensee has determined that use of a SAFSTOR analysis shows that there is presently reasonable assurance that adequate funds will be available for the decommissioning process in compliance with NRC decommissioning funding assurance rules.

Pursuant to 10 CFR 50.75(e)(1)(i), "A licensee that has prepaid funds based on a site-specific estimate under § 50.75(b)(1) of this section may take credit for projected earnings on the prepaid decommissioning trust funds, using up to a 2 percent annual real rate of return from the time of future funds' collection through the projected decommissioning period, provided that the site-specific estimate is based on a period of safe storage that is specifically described in the estimate." The licensee understands that a facility-specific analysis may be used for demonstrating the adequacy of decommissioning funds, provided that "the NRC-required cost estimate for decommissioning costs as defined in 10 CFR 50.2 is equal to or greater than the amount stated in the formulas in 10 CFR 50.75(c)(1) and (2) as the basis for justifying a higher than minimum funding level." (Regulatory Guide 1.159 Rev. 2, Section 1.1.1.) The licensee also understands that NRC should be provided the analysis, and that the analysis should include data for each year of the analysis. An updated decommissioning estimate was provided with the licensee's Post Shutdown Decommissioning Activities Report on November 16, 2018 (Reference 1).

The Pilgrim site-specific decommissioning cost estimate is based on a period of safe storage that is specifically described in the estimate, namely storage until approximately 2080, at which time the plant decommissioning will be completed and the site released for alternative use without restriction. Table 14-1 below provides the annual license termination and spent fuel management costs computed in the updated estimate. The decommissioning trust fund (DTF) ending balance is escalated each year by the 2% real growth figure allowed pursuant to 10 CFR 50.75(e)(1)(i).

Thus, considering the fund balance of \$1,028 million, as of December 31, 2018, and projected fund earnings during the SAFSTOR period (assuming an annual 2% growth rate), the trust fund

**Entergy Nuclear Operations, Inc.  
Pilgrim Annual Cash Flow Analysis  
For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

is expected to have an excess of \$113.7 million after completion of license termination and the operational spent fuel management activities that will be funded by the trust fund.

REFERENCES:

1. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Pilgrim, Post Shutdown Decommissioning Activities Report," dated November 16, 2018 (Accession No. ML18320A034).
2. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Update to Irradiated Fuel Management Program Pursuant to 10 CFR 50.54(bb)," dated November 16, 2018 (Accession No. ML18320A036).
3. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Request for Exemption from 10 CFR 50.82(a)(8)(i)(A), Pilgrim Nuclear Power Station," dated November 16, 2018 (Accession No. ML18320A037).

**Entergy Nuclear Operations, Inc.**  
**Pilgrim Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

| Table 14-1   |  |   |  |   |  |                                   |                                     |  |   |
|--|--|---|--|---|--|-----------------------------------|-------------------------------------|--|---|
| Pilgrim Nuclear Power Station - SAFSTOR Methodology  |  |   |  |   |  |                                   |                                     |  |   |
| Annual Cash Flow Analysis - Total License Termination, Spent Fuel Management less Dry Fuel Costs |  |   |  |   |  |                                   |                                     |  |   |
| (In Thousands in 2018 Dollars) (see column definitions below)                                    |  |   |  |   |  |                                   |                                     |  |   |
| Year   | Column 1<br>50.75<br>License<br>Termination<br>Cost<br>(\$000's) | Column 2<br>50.54 (bb)<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | Column 3<br>Exclude<br>Dry Fuel<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | Column 4<br>License<br>Termination<br>Cost plus<br>Spent Fuel<br>Management<br>Cost less<br>Dry Fuel<br>Cost<br>(\$000's) | Column 5<br>Beginning<br>of Year<br>Trust Fund<br>Balance<br>(\$000's) | Column 6<br>Withdraw<br>(\$000's) | Column 7<br>Contribute<br>(\$000's) | Column 8<br>Trust<br>Fund<br>Earnings<br>(\$000's) | Column 9<br>Year<br>Ending<br>Trust<br>Fund<br>Balance<br>(\$000's) |
| 2019   | 119,166  | 76,149  | 0  | 195,315   | 1,027,714  | 195,315                           | 0                                   | 16,648   | 849,047   |
| 2020   | 61,574   | 54,694  | 0  | 116,268   | 849,047  | 116,268                           | 0                                   | 14,656   | 747,435   |
| 2021   | 46,032   | 48,898  | 0  | 94,930  | 747,435  | 94,930                            | 0                                   | 13,050   | 665,555   |
| 2022   | 43,799   | 48,898  | 0  | 92,697  | 665,555  | 92,697                            | 0                                   | 11,457   | 584,315   |
| 2023   | 14,516   | 12,882  | 0  | 27,398  | 584,315  | 27,398                            | 0                                   | 11,138   | 568,055   |
| 2024   | 6,897  | 4,322   |  | 11,219  | 568,055  | 11,219                            | 0                                   | 11,137   | 567,973   |
| 2025   | 6,259  | 4,310   |  | 10,569  | 567,973  | 10,569                            | 0                                   | 11,148   | 568,552   |
| 2026   | 5,884  | 4,310   |  | 10,194  | 568,552  | 10,194                            | 0                                   | 11,167   | 569,526   |
| 2027   | 5,884  | 4,310   |  | 10,194  | 569,526  | 10,194                            | 0                                   | 11,187   | 570,519   |
| 2028   | 5,897  | 4,322   |  | 10,219  | 570,519  | 10,219                            | 0                                   | 11,206   | 571,506   |
| 2029   | 5,884  | 4,310   |  | 10,194  | 571,506  | 10,194                            | 0                                   | 11,226   | 572,539   |
| 2030   | 5,884  | 4,310   |  | 10,194  | 572,539  | 10,194                            | 0                                   | 11,247   | 573,592   |
| 2031   | 5,884  | 4,655   |  | 10,539  | 573,592  | 10,539                            | 0                                   | 11,261   | 574,315   |
| 2032   | 5,897  | 5,529   |  | 11,427  | 574,315  | 11,427                            | 0                                   | 11,258   | 574,146   |
| 2033   | 5,884  | 4,310   |  | 10,194  | 574,146  | 10,194                            | 0                                   | 11,279   | 575,231   |
| 2034   | 5,884  | 4,482   |  | 10,366  | 575,231  | 10,366                            | 0                                   | 11,297   | 576,163   |
| 2035   | 5,884  | 5,000   |  | 10,884  | 576,163  | 10,884                            | 0                                   | 11,306   | 576,585   |
| 2036   | 5,897  | 4,839   |  | 10,737  | 576,585  | 10,737                            | 0                                   | 11,317   | 577,165   |
| 2037   | 5,884  | 4,310   |  | 10,194  | 577,165  | 10,194                            | 0                                   | 11,339   | 578,311   |
| 2038   | 5,884  | 4,827   |  | 10,711  | 578,311  | 10,711                            | 0                                   | 11,352   | 578,952   |
| 2039   | 5,884  | 4,310   |  | 10,194  | 578,952  | 10,194                            | 0                                   | 11,375   | 580,134   |
| 2040   | 5,897  | 4,322   |  | 10,219  | 580,134  | 10,219                            | 0                                   | 11,398   | 581,313   |
| 2041   | 5,884  | 4,827   |  | 10,711  | 581,313  | 10,711                            | 0                                   | 11,412   | 582,014   |
| 2042   | 5,884  | 4,655   |  | 10,539  | 582,014  | 10,539                            | 0                                   | 11,430   | 582,905   |
| 2043   | 5,884  | 4,655   |  | 10,539  | 582,905  | 10,539                            | 0                                   | 11,447   | 583,813   |
| 2044   | 5,897  | 4,322   |  | 10,219  | 583,813  | 10,219                            | 0                                   | 11,472   | 585,066   |
| 2045   | 5,884  | 4,827   |  | 10,711  | 585,066  | 10,711                            | 0                                   | 11,487   | 585,842   |



**Entergy Nuclear Operations, Inc.**  
**Pilgrim Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

| Table 14-1   |  |   |  |   |  |                                   |                                     |  |   |
|--|--|---|--|---|--|-----------------------------------|-------------------------------------|--|---|
| Pilgrim Nuclear Power Station - SAFSTOR Methodology  |  |   |  |   |  |                                   |                                     |  |   |
| Annual Cash Flow Analysis - Total License Termination, Spent Fuel Management less Dry Fuel Costs |  |   |  |   |  |                                   |                                     |  |   |
| (In Thousands in 2018 Dollars) (see column definitions below)                                    |  |   |  |   |  |                                   |                                     |  |   |
| Year   | Column 1<br>50.75<br>License<br>Termination<br>Cost<br>(\$000's) | Column 2<br>50.54 (bb)<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | Column 3<br>Exclude<br>Dry Fuel<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | Column 4<br>License<br>Termination<br>Cost plus<br>Spent Fuel<br>Management<br>Cost less<br>Dry Fuel<br>Cost<br>(\$000's) | Column 5<br>Beginning<br>of Year<br>Trust Fund<br>Balance<br>(\$000's) | Column 6<br>Withdraw<br>(\$000's) | Column 7<br>Contribute<br>(\$000's) | Column 8<br>Trust<br>Fund<br>Earnings<br>(\$000's) | Column 9<br>Year<br>Ending<br>Trust<br>Fund<br>Balance<br>(\$000's) |
| 2046   | 5,884  | 4,310   |  | 10,194  | 585,842  | 10,194                            | 0                                   | 11,513   | 587,162   |
| 2047   | 5,884  | 4,655   |  | 10,539  | 587,162  | 10,539                            | 0                                   | 11,532   | 588,156   |
| 2048   | 5,897  | 4,667   |  | 10,564  | 588,156  | 10,564                            | 0                                   | 11,552   | 589,143   |
| 2049   | 5,884  | 4,827   |  | 10,711  | 589,143  | 10,711                            | 0                                   | 11,569   | 590,001   |
| 2050   | 5,884  | 4,310   |  | 10,194  | 590,001  | 10,194                            | 0                                   | 11,596   | 591,404   |
| 2051   | 5,884  | 4,655   |  | 10,539  | 591,404  | 10,539                            | 0                                   | 11,617   | 592,482   |
| 2052   | 5,897  | 4,667   |  | 10,564  | 592,482  | 10,564                            | 0                                   | 11,638   | 593,557   |
| 2053   | 5,884  | 4,310   |  | 10,194  | 593,557  | 10,194                            | 0                                   | 11,667   | 595,030   |
| 2054   | 5,884  | 4,655   |  | 10,539  | 595,030  | 10,539                            | 0                                   | 11,690   | 596,182   |
| 2055   | 5,884  | 4,655   |  | 10,539  | 596,182  | 10,539                            | 0                                   | 11,713   | 597,356   |
| 2056   | 5,897  | 4,322   |  | 10,219  | 597,356  | 10,219                            | 0                                   | 11,743   | 598,879   |
| 2057   | 5,884  | 4,655   |  | 10,539  | 598,879  | 10,539                            | 0                                   | 11,767   | 600,108   |
| 2058   | 5,884  | 4,310   |  | 10,194  | 600,108  | 10,194                            | 0                                   | 11,798   | 601,713   |
| 2059   | 5,884  | 4,655   |  | 10,539  | 601,713  | 10,539                            | 0                                   | 11,823   | 602,998   |
| 2060   | 5,897  | 4,839   |  | 10,737  | 602,998  | 10,737                            | 0                                   | 11,845   | 604,106   |
| 2061   | 5,884  | 4,310   |  | 10,194  | 604,106  | 10,194                            | 0                                   | 11,878   | 605,791   |
| 2062   | 5,884  | 5,862   |  | 11,746  | 605,791  | 11,746                            | 0                                   | 11,881   | 605,926   |
| 2063   | 4,697  | 0   |  | 4,697   | 605,926  | 4,697                             | 0                                   | 12,025   | 613,253   |
| 2064   | 4,710  | 0   |  | 4,710   | 613,253  | 4,710                             | 0                                   | 12,171   | 620,714   |
| 2065   | 4,697  | 0   |  | 4,697   | 620,714  | 4,697                             | 0                                   | 12,320   | 628,337   |
| 2066   | 4,697  | 0   |  | 4,697   | 628,337  | 4,697                             | 0                                   | 12,473   | 636,113   |
| 2067   | 4,697  | 0   |  | 4,697   | 636,113  | 4,697                             | 0                                   | 12,628   | 644,044   |
| 2068   | 4,710  | 0   |  | 4,710   | 644,044  | 4,710                             | 0                                   | 12,787   | 652,120   |
| 2069   | 4,697  | 0   |  | 4,697   | 652,120  | 4,697                             | 0                                   | 12,948   | 660,371   |
| 2070   | 4,697  | 0   |  | 4,697   | 660,371  | 4,697                             | 0                                   | 13,113   | 668,788   |
| 2071   | 4,697  | 0   |  | 4,697   | 668,788  | 4,697                             | 0                                   | 13,282   | 677,372   |
| 2072   | 4,710  | 0   |  | 4,710   | 677,372  | 4,710                             | 0                                   | 13,453   | 686,115   |
| 2073   | 28,634   | 0   |  | 28,634  | 686,115  | 28,634                            | 0                                   | 13,150   | 670,632   |

**Entergy Nuclear Operations, Inc.**  
**Pilgrim Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

| Table 14-1   |   |  |   |  |   |  |  |   |  |
|--|---|--|---|--|---|--|--|---|--|
| Pilgrim Nuclear Power Station - SAFSTOR Methodology  |   |  |   |  |   |  |  |   |  |
| Annual Cash Flow Analysis - Total License Termination, Spent Fuel Management less Dry Fuel Costs |   |  |   |  |   |  |  |   |  |
| (In Thousands in 2018 Dollars) (see column definitions below)                                    |   |  |   |  |   |  |  |   |  |
| Year   | <u>Column 1</u><br>50.75<br>License<br>Termination<br>Cost<br>(\$000's) | <u>Column 2</u><br>50.54 (bb)<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | <u>Column 3</u><br>Exclude<br>Dry Fuel<br>Spent Fuel<br>Management<br>Cost<br>(\$000's) | <u>Column 4</u><br>License<br>Termination<br>Cost plus<br>Spent Fuel<br>Management<br>Cost less<br>Dry Fuel<br>Cost<br>(\$000's) | <u>Column 5</u><br>Beginning<br>of Year<br>Trust Fund<br>Balance<br>(\$000's) | <u>Column 6</u><br>Withdraw<br>(\$000's) | <u>Column 7</u><br>Contribute<br>(\$000's) | <u>Column 8</u><br>Trust<br>Fund<br>Earnings<br>(\$000's) | <u>Column 9</u><br>Year<br>Ending<br>Trust<br>Fund<br>Balance<br>(\$000's) |
| 2074   | 61,751  | 0  |   | 61,751   | 670,632   | 61,751                                   | 0  | 12,178  | 621,058  |
| 2075   | 160,046   | 0  |   | 160,046  | 621,058   | 160,046                                  | 0  | 9,220   | 470,233  |
| 2076   | 138,344   | 0  |   | 138,344  | 470,233   | 138,344                                  | 0  | 6,638   | 338,526  |
| 2077   | 120,920   | 0  |   | 120,920  | 338,526   | 120,920                                  | 0  | 4,352   | 221,959  |
| 2078   | 96,205  | 0  |   | 96,205   | 221,959   | 96,205                                   | 0  | 2,515   | 128,268  |
| 2079   | 18,888  | 0  |   | 18,888   | 128,268   | 18,888                                   | 0  | 2,188   | 111,568  |
| 2080   | 137   | 0  |   | 137  | 111,568   | 137                                      | 0  | 2,229   | 113,660  |
|  |   |  |   |  |   |  |  |   |  |
| Total  | 1,187,994   | 420,250  | 0   | 1,608,244  |   | 1,608,244                                | 0  | 694,190   | 113,660  |

As can be seen from the information provided in Table 14-1, the required funding for SAFSTOR decommissioning, \$1,188.00 million, is greater than the NRC formula amount per 10 CFR 50.75(b) and (c) of \$633.27 million, therefore, the site-specific analysis complies with the requirement from Regulatory Guide 1.159 section 1.1.1 previously discussed. The foregoing SAFSTOR analysis shows that when the December 31, 2018, DTF balance is escalated at the allowable rate and compared against the annual figures for the SAFSTOR period, that an approximately \$113.7 million surplus exists at the end of the decommissioning project. ISFSI decommissioning costs will be paid for out of the aforementioned excess funds if not paid for by spent fuel litigation proceeds. Accordingly, the licensee concludes that no further action is required at this time to demonstrate adequate funding assurance for decommissioning Pilgrim.

**Entergy Nuclear Operations, Inc.  
Pilgrim Annual Cash Flow Analysis  
For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

**Table 13-1 Definitions:**

**Column 1: 50.75 License Termination Cost**

Reflects the Total Annual License Termination Plan cost in 2018 dollars at a 0.0% escalation rate

**Column 2: 50.54 (bb) Spent Fuel Management Cost**

Reflects the Total Annual Irradiated Fuel Management Plan cost in 2018 dollars at a 0.0% escalation rate

**Column 3: Exclude Transfer to Dry Fuel Storage Cost**

Reflects the Transfer to Dry Fuel Storage Cost included in Column 2 that is planned to be funded by external credit facilities, in 2018 dollars at a 0.0% escalation rate

**Column 4: License Termination Cost plus Spent Fuel Management Cost less Transfer to Dry Fuel Storage Cost**

Reflects the Total Annual License Termination Plan cost plus Total Spent Fuel Management Plan cost less Transfer to Dry Fuel Storage cost all in 2018 dollars at a 0.0% escalation rate (Column 1 + Column 2 - Column 3)

**Column 5: Beginning of Year Trust Fund Balance**

Reflects the beginning of year Trust Fund balance in 2018 dollars at a 0.0% escalation rate and 2.0% Fund Earnings

**Column 6: Withdraw**

Reflects the annual expenditures from the Trust Fund in 2018 dollars at a 0.0% escalation rate (equals Column 4)

**Column 7: Contribute**

Reflects the annual contributions to the Trust Fund in 2018 dollars at a 0.0% escalation rate

**Column 8: Trust Fund Earnings**

**Entergy Nuclear Operations, Inc.**  
**Pilgrim Annual Cash Flow Analysis**  
**For Year Ending December 31, 2018 - 10 CFR 50.75(f)(1)**

Reflects earnings on funds remaining in the trust. A 2.0% Earnings rate is used over a 0.0% cost escalation rate. The Annual 2.0% earnings are calculated on the beginning balance less 100% of the projected annual expenditure for each year. (Column 5 - 100% of Column 6) \* 2.0%

**Column 9: Year Ending Trust Fund Balance**

Reflects the end of year Trust Fund balance after all projected earnings are added and all projected expenditures are deducted specified at a 0.0% escalation rate and 2.0% Fund Earnings in 2018 dollars. (Column 5 - Column 6 + Column 7 + Column 8)

**Entergy Nuclear Operations, Inc.**  
**Minimum Financial Assurance Calculation Worksheets**

**Plant name:** **Indian Point Energy Center, Unit 1**

**Month** **Day** **Year**

**Year of Biennial:** 12 31 2018

**Termination of Operation:** 9 28 2013

|     | <u>MWth</u> | <u>1986\$</u> | ECI   | Base LX | <u>Lx</u> | Px    | Fx    | Ex   | <u>Bx</u> |
|-----|-------------|---------------|-------|---------|-----------|-------|-------|------|-----------|
| PWR | 615         | \$85,560,000  | 136.5 | 2.16    | 2.95      | 2.103 | 2.727 | 2.37 | 12.853    |

**NRC Minimum:** **\$432,214,534** **Site Specific: \$583,418,090**

| Licensee: | % Owned: | Amount of NRC Minimum/Site Specific: | Amount in Trust Fund: |
|-----------|----------|--------------------------------------|-----------------------|
| Entergy   | 100.00%  | \$583,418,090                        | \$471,203,402         |

Note: See Attachment 12 for adequacy of the trust fund.

Entergy Nuclear Operations, Inc.  
Minimum Financial Assurance Calculation Worksheets

Plant name: Indian Point Energy Center, Unit 2

Year of Biennial: 2018  
Termination of Operation: 2024

Month 12  
Day 31

|     |      |               |       |         |      |       |       |      |        |
|-----|------|---------------|-------|---------|------|-------|-------|------|--------|
|     | MWth | 1986\$        | ECl   | Base Lx | Lx   | Px    | Fx    | Ex   | Bx     |
| PWR | 3216 | \$103,300,800 | 136.5 | 2.16    | 0.65 | 2.103 | 2.727 | 0.13 | 2.37   |
|     |      |               |       |         |      |       |       |      | 12.853 |

NRC Minimum: \$521,833,884 Site Specific:

|                   |                  |  |                                     |
|-------------------|------------------|--|-------------------------------------|
| Licensee: Entergy | % Owned: 100.00% | Amount of NRC Minimum/Site Specific: \$521,833,884 | Amount in Trust Fund: \$598,412,232 |
|-------------------|------------------|--|-------------------------------------|

Step 1:

Earnings Credit:

|   |                                  |                             |                            |                               |
|---|----------------------------------|-----------------------------|----------------------------|-------------------------------|
| Trust Fund Balance: \$598,412,232                                   | Real Rate of Return per year: 2% | Years Left In License: 5.33 | Total Real Rate of: 1.1133 | Total Earnings: \$665,034,970 |
| Total Earnings = Trust Fund balance x (1+RRR)^Years left in license |                                  |                             |                            |                               |

Step 2:

Accumulation:

|                                |                                  |                     |                    |
|--------------------------------|----------------------------------|---------------------|--------------------|
| Value of Annuity per year: \$0 | Real Rate of Return per year: 2% | Years of Annuity: 0 | Total Annuity: \$0 |
|--------------------------------|----------------------------------|---------------------|--------------------|

Step 3:

Decom Period:

|  |                                  |                 |                             |   |
|--|----------------------------------|-----------------|-----------------------------|---|
| Total Earnings: \$665,034,970  | Real Rate of Return per year: 2% | Decom Period: 7 | Total Real Rate of: 0.14869 | Total Earnings for Decom: \$49,440,584            |
| Total Earnings for Decom = (1/2) x Total Earnings x [(1+RRR)^Decom period - 1] |                                  |                 |                             |   |
| Total of Steps 1 - 3: \$714,475,555  |                                  |                 |                             | Total = Total Earnings + Total Earnings for Decom |

|                    |    |             |                                  |
|--------------------|----|-------------|----------------------------------|
| Excess (Shortfall) | \$ | 192,641,670 | to NRC minimum                   |
|                    | \$ | (8,455,833) | Less ISFSI                       |
|                    | \$ | -           | Parent Co Guaranty               |
|                    | \$ | 184,185,837 | Total Excess Financial Assurance |

**Entergy Nuclear Operations, Inc.  
Minimum Financial Assurance Calculation Worksheets**

**Plant name:** Indian Point Energy Center, Unit 3

**Year of Biennial:** Month 12 Day 31 Year 2018

**Termination of Operation:** 4 30 2025

|     |              |                         |              |                 |      |            |             |             |      |            |              |
|-----|--------------|-------------------------|--------------|-----------------|------|------------|-------------|-------------|------|------------|--------------|
| PWR | MWth<br>3216 | 1986\$<br>\$103,300,800 | ECI<br>136.5 | Base Lx<br>2.16 | 0.65 | Lx<br>2.95 | Px<br>2.103 | Fx<br>2.727 | 0.13 | Ex<br>2.37 | Bx<br>12.853 |
|-----|--------------|-------------------------|--------------|-----------------|------|------------|-------------|-------------|------|------------|--------------|

**NRC Minimum: \$521,833,884 Site Specific:**

|                      |                     |   |  |
|----------------------|---------------------|---|--|
| Licensee:<br>Entergy | % Owned:<br>100.00% | Amount of NRC Minimum/Site Specific:<br>\$521,833,884 | Amount in Trust Fund:<br>\$780,593,070 |
|----------------------|---------------------|---|--|

**Step 1:**

**Earnings Credit:**

|                                      |                               |                                  |                                  |                                  |   |
|--------------------------------------|-------------------------------|----------------------------------|----------------------------------|----------------------------------|---|
| Trust Fund Balance:<br>\$780,593,070 | Real Rate of Return per<br>2% | Years Left<br>in License<br>6.33 | Total Real<br>Rate of<br>1.13356 | Total Earnings:<br>\$684,848,428 | Total Earnings = Trust Fund balance x (1+RRR)^Years left in license |
|--------------------------------------|-------------------------------|----------------------------------|----------------------------------|----------------------------------|---|

**Step 2:**

**Accumulation:**

|                                     |                               |                        |                       |
|-------------------------------------|-------------------------------|------------------------|-----------------------|
| Value of Annuity per<br>year<br>\$0 | Real Rate of Return per<br>2% | Years of Annuity:<br>0 | Total Annuity:<br>\$0 |
|-------------------------------------|-------------------------------|------------------------|-----------------------|

**Step 3:**

**Decom Period:**

|                                  |                               |                       |                                  |   |  |
|----------------------------------|-------------------------------|-----------------------|----------------------------------|---|--|
| Total Earnings:<br>\$684,848,428 | Real Rate of Return per<br>2% | Decom<br>Period:<br>7 | Total Real<br>Rate of<br>0.14869 | Total Earnings for Decom:<br>\$65,782,140 | Total Earnings for Decom = (1/2) x Total Earnings x [(1+RRR)^Decom period - 1] |
|----------------------------------|-------------------------------|-----------------------|----------------------------------|---|--|

|  |   |
|--|---|
| Total of Steps 1 - 3:<br>\$950,630,568 | Total = Total Earnings + Total Earnings for Decom |
|--|---|

|                    |    |              |                                  |
|--------------------|----|--------------|----------------------------------|
| Excess (Shortfall) | \$ | 428,796,683  | to NRC minimum                   |
|                    | \$ | (10,147,000) | Less ISFSI                       |
|                    | \$ | -            | Parent Co Guaranty               |
|                    | \$ | 418,649,683  | Total Excess Financial Assurance |

**Entergy Nuclear Operations, Inc.  
Minimum Financial Assurance Calculation Worksheets**

**Plant name:** **Vermont Yankee Power Station**

**Month**      **Day**      **Year**

**Year of Biennial:**      12      31      2018

**Termination of Operation:**      12      29      2014

|     | MWth | 1986\$        | ECI   | Base Lx | Lx   | Px    | Fx    | Ex   | Bx     |
|-----|------|---------------|-------|---------|------|-------|-------|------|--------|
| BWR | 1912 | \$121,208,000 | 136.5 | 2.16    | 2.95 | 2.103 | 2.727 | 2.39 | 13.422 |

**NRC Minimum:**      **\$627,859,619**      **Site Specific:**      **\$668,374,404**

| Licensee: | % Owned: | Amount of NRC Minimum/Site Specific: | Amount in Trust Fund: |
|-----------|----------|--------------------------------------|-----------------------|
| Entergy   | 100.00%  | \$668,374,404                        | \$498,431,965         |

Note: See Attachment 13 for adequacy of the trust fund.



**Entergy Nuclear Operations, Inc.**  
**Minimum Financial Assurance Calculation Worksheets**

**Plant name:** **Pilgrim Nuclear Generating Station**

**Month** **Day** **Year**

**Year of Biennial:** 12 31 2018

**Termination of Operation:** 5 31 2019

|     | MWth | 1986\$        | ECI   | Base Lx | Lx   | Px    | Fx    | Ex   | Bx     |
|-----|------|---------------|-------|---------|------|-------|-------|------|--------|
| BWR | 2028 | \$122,252,000 | 136.5 | 2.16    | 2.95 | 2.103 | 2.727 | 2.39 | 13.422 |

**NRC Minimum:** **\$633,267,558** **Site Specific:** **\$1,187,994,231**

| Licensee: | % Owned: | Amount of NRC Minimum/Site Specific: | Amount in Trust Fund: |
|-----------|----------|--------------------------------------|-----------------------|
| Entergy   | 100.00%  | \$1,187,994,231                      | \$1,027,714,005       |

Note: See Attachment 14 for adequacy of the trust fund.

## Palisades Nuclear Plant

Year

2022

### Site Specific:

**Just F**  
**,004**

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Total Annuity:

### II Earnings for Decom:

|                    |    |             |                                  |
|--------------------|----|-------------|----------------------------------|
| Excess (Shortfall) | \$ | 29,540,921  | to NRC minimum                   |
|                    | \$ | (7,996,000) | Less ISFSI                       |
|                    | \$ | -           | Parent Co Guaranty               |
|                    | \$ | 21,544,921  | Total Excess Financial Assurance |