



Entergy Nuclear Operations, Inc
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Mandy Halter
Director, Nuclear Licensing

CNRO-2018-00014

10 CFR 50.82(a)(8)(vii)

March 29, 2018

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

SUBJECT: Status of Funding for Managing Irradiated Fuel For Year Ending December 31,
2017 – 10 CFR 50.82(a)(8)(vii)

Entergy Nuclear Operations, Inc.

Indian Point Nuclear Generating Station 1
Docket No. 50-003
License No. DPR-5

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

Vermont Yankee
Docket No. 50-271
License No. DPR-28

Dear Sir or Madam:

10 CFR 50.82(a)(8)(vii) requires that after submitting its site-specific decommissioning cost estimate pursuant to 10 CFR 50.82(a)(4)(i), a licensee must annually submit to the NRC, by March 31, a report on the status of its funding for managing irradiated fuel. On behalf of Entergy Nuclear Indian Point 2, LLC, and Entergy Nuclear Palisades, LLC, and Entergy Nuclear Vermont Yankee, LLC, Entergy Nuclear Operations, Inc. hereby submits the information required for Indian Point 1, Big Rock Point, and Vermont Yankee. All or most of the spent fuel management costs are a liability of the U.S. Government as a result of its breach of the spent fuel disposal contract. However, this report takes no credit for recoveries on that liability.

There are no new regulatory commitments made in this letter. If you have any questions, please contact Mr. Philip Couture at 601-368-5102.

Sincerely,

A handwritten signature in black ink that reads "Mandy Halter".

MKH/ljs/plc

- Attachments:
1. Entergy Nuclear Operations, Inc. Status of Funding for Managing Irradiated Fuel - Indian Point 1, for Year Ending December 31, 2017 – 10 CFR 50.82(a)(8)(vii)
 2. Entergy Nuclear Operations, Inc. Status of Funding for Managing Irradiated Fuel - Big Rock Point, for Year Ending December 31, 2017 – 10 CFR 50.82(a)(8)(vii)
 3. Entergy Nuclear Operations, Inc. Status of Funding for Managing Irradiated Fuel - Vermont Yankee, for Year Ending December 31, 2017 – 10 CFR 50.82(a)(8)(vii)

cc:

Mr. A. C. Bakken (ECH)
Mr. K. R. Jury (ECH)
Mr. B. E. Green (TMBR)
Mr. L. M. Coyle (ECH)
Mr. C. F. Arnone (PAL)
Mr. C. R. Costanzo (ECH)
Mr. L. J. Smith (ECH)
Mr. A. J. Vitale (IPEC)
Mr. C. R. Daniels (VTY)

USNRC Regional Administrator, Region I
USNRC Regional Administrator, Region III
USNRC Project Manager, Indian Point 1
USNRC Project Manager, Indian Point 2
USNRC Project Manager, Indian Point 3
USNRC Project Manager, Big Rock Point
USNRC Project Manager, Palisades
USNRC Project Manager, Vermont Yankee
USNRC Resident Inspector, Indian Point 2
USNRC Resident Inspector, Indian Point 3
USNRC Resident Inspector, Palisades

Michigan Department of Environmental Quality
Michigan Public Service Commission
NYS Department of Public Service
Vermont Department of Public Service

Attachment 1
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Entergy Nuclear Operations, Inc.
Status of Funding for Managing Irradiated Fuel – Indian Point 1
For Year Ending December 31, 2017 - 10 CFR 50.82(a)(8)(vii)

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

- | | |
|---|------------------------------|
| 1. Funds accumulated to cover the cost of managing irradiated fuel as of 12/31/2017 | \$246.83 million
[Note 1] |
| 2. Projected costs to manage fuel until DOE removal (2017\$) | \$55.27 million |
| 3. Plan as required | See Note 2 |

Note 1: This amount represents the excess funds available in the Unit 1 decommissioning trust fund less an amount necessary to decommission the Independent Spent Fuel Storage Installation (ISFSI). Per Unit 1's updated decommissioning cost analysis, the present value (2017\$) of excess funds in Unit 1's decommissioning trust at the end of decommissioning in 2073, after considering license termination expenses, is \$247.98 million ($\$736.94 \text{ million} / (1.02)^{(2073-2018)}$). See Ending DTF Balance for 2073, Table 12-1, Decommissioning Funding Status Report per 10 CFR §50.75(f)(1) and 10 CFR 50.82(a)(8)(v) -- Entergy Nuclear Operations, Inc., filed March 2018 (Reference 1). The estimated cost for decommissioning Indian Point 1 and 2's share of the site ISFSI is \$7.13 million. Of the 31 casks from Indian Point 1 and 2 on the ISFSI, 5 are attributable to Unit 1, or 16.1%. Unit 1's share of ISFSI decommissioning cost is calculated as 16.1% x \$7.13 million, or \$1.15 million. Thus, the present value of Unit 1 trust funds available for spent fuel management is \$247.98 million minus \$1.15 million, or \$246.83 million. For purposes of this report only, Indian Point 1 trust funds are being considered separately from Indian Point 2 trust funds; however, both funds are covered by a single trust agreement, and will likely be handled together upon decommissioning.

Note 2: The excess currently existing in Unit 1's decommissioning trust is sufficient to cover the estimated costs of spent fuel management. The licensee acknowledges the need for an exemption pursuant to 10 CFR §50.12(a) to use radiological decommissioning trust funds for costs other than decommissioning activities as defined in 10 CFR 50.2.

REFERENCE: 1. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Decommissioning Funding Status Report per 10 CFR §50.75(f)(1) and 10 CFR 50.82(a)(8)(v) -- Entergy Nuclear Operations, Inc.," CNRO-2018-00012, dated March 29, 2018

Attachment 2
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Entergy Nuclear Operations, Inc.
Status of Funding for Managing Irradiated Fuel – Big Rock Point
For Year Ending December 31, 2017 - 10 CFR 50.82(a)(8)(vii)

Plant Name: **Big Rock Point**

- | | |
|---|-----------------------------------|
| 1. Funds accumulated to cover the cost of managing irradiated fuel as of 12/31/2017 | See Note 1 |
| 2. Projected costs to manage fuel until DOE removal (2017\$) | \$50.29 million ^{Note 2} |
| 3. Plan as required | See Note 1 |

Note 1: Spent fuel management costs have been paid for out of Entergy Nuclear Palisades, LLC operating funds since Big Rock Point was acquired from Consumers Energy on April 11, 2007. Entergy Nuclear Palisades, LLC plans to continue paying for spent fuel management costs from said operating funds. Therefore, no funds are specifically accumulated for the cost of managing irradiated fuel at Big Rock Point as of 12/31/2017.

Note 2: Projected costs to manage fuel until DOE removal computed using an assumed date of the completion of fuel removal from site of 2039

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**Entergy Nuclear Operations, Inc.
Status of Funding for Managing Irradiated Fuel – Vermont Yankee
For Year Ending December 31, 2017 - 10 CFR 50.82(a)(8)(vii)**

Plant Name: **Vermont Yankee**

- | | |
|---|------------------------------|
| 1. Funds accumulated to cover the cost of managing irradiated fuel as of 12/31/2017 | \$230.94 million
[Note 1] |
| 2. Projected costs to manage fuel until DOE removal (2017\$) | \$220.96 million |
| 3. Plan as required | See Note 2 |

Note 1: This amount represents the excess funds available in the Vermont Yankee decommissioning trust fund less an amount necessary to decommission the Independent Spent Fuel Storage Installation (ISFSI). Per Vermont Yankee's site-specific decommissioning cost estimate (Reference 1), the present value of excess funds in the decommissioning trust at the end of decommissioning in 2075, after considering license termination expenses, is \$236.27 million ($\$730.51 \text{ million} / (1.02)^{(2075-2018)}$). See Table 3-1 below. Table 3-1 has been constructed by removing spent fuel management expenses from Table 13-1, Decommissioning Funding Status Report per 10 CFR §50.75(f)(1) and 10 CFR 50.82(a)(8)(v) -- Entergy Nuclear Operations, Inc. filed March 2018 (Reference 2), to yield the surplus at the end of decommissioning that would otherwise be available for spent fuel management and ISFSI decommissioning. This calculated surplus takes into account available funds in the decommissioning trust. The estimated cost for decommissioning Vermont Yankee's ISFSI is \$5.33 million. Thus, the present value of Vermont Yankee trust funds available for spent fuel management is \$236.27 million minus \$5.33 million, or \$230.94 million.

Note 2: Attachment 13 of Reference 2 demonstrates that the Vermont Yankee decommissioning trust fund is sufficiently funded for all license termination activities and certain spent fuel management activities (i.e., operational costs, shown in Col. 2, less Col. 3, of Table 13-1 of Reference 3), and reflects completion of the transfer to dry fuel storage in 2018. As discussed in the Irradiated Fuel Management Program Update (Reference 3) costs related to spent fuel management operations (e.g., operations and maintenance costs for the spent fuel and Independent Spent Fuel Storage Installation, totaling approximately \$161 million) will be funded from the decommissioning trust fund. Entergy Nuclear Operations, Inc. obtained an exemption that allows the use of trust funds for spent fuel management activities (Reference 4). The remaining \$60 million is associated with transfer of spent fuel to dry storage (e.g., procurement of dry storage systems, transfer of fuel from the spent fuel pool to the Independent Spent Fuel Storage Installation (ISFSI). To fund the "transfer to dry storage" portion of spent fuel management costs, Entergy Nuclear Vermont Yankee, LLC has established two separate revolving credit facilities from third party banks totaling \$145 million.

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**Entergy Nuclear Operations, Inc.
Status of Funding for Managing Irradiated Fuel – Vermont Yankee
For Year Ending December 31, 2017 - 10 CFR 50.82(a)(8)(vii)**

Table 3-1

Vermont Yankee Nuclear Power Station - SAFSTOR Methodology									
Annual Cash Flow Analysis - Total License Termination									
(In Thousands in 2017 Dollars)									
<u>Year</u>	<u>Column 1</u> 50.75 License Termination Cost (\$000's)	<u>Column 2</u> 50.54 (bb) Spent Fuel Management Cost (\$000's)	<u>Column 3</u> Exclude Dry Fuel Spent Fuel Management Cost (\$000's)	<u>Column 4</u> License Termination Cost plus Spent Fuel Management Cost less Dry Fuel Cost (\$000's)	<u>Column 5</u> Beginning of Year Trust Fund Balance (\$000's)	<u>Column 6</u> Withdraw (\$000's)	<u>Column 7</u> Contribute (\$000's)	<u>Column 8</u> Trust Fund Earnings (\$000's)	<u>Column 9</u> Year Ending Trust Fund Balance (\$000's)
2018	63,992			63,992	581,539	63,992	0	10,351	527,897
2019	5,560			5,560	527,897	5,560	0	10,447	532,784
2020	5,506			5,506	532,784	5,506	0	10,546	537,824
2021	5,506			5,506	537,824	5,506	0	10,646	542,965
2022	3,842			3,842	542,965	3,842	0	10,782	549,905
2023	3,842			3,842	549,905	3,842	0	10,921	556,984
2024	3,842			3,842	556,984	3,842	0	11,063	564,205
2025	3,779			3,779	564,205	3,779	0	11,209	571,635
2026	3,932			3,932	571,635	3,932	0	11,354	579,057
2027	3,986			3,986	579,057	3,986	0	11,501	586,572
2028	3,941			3,941	586,572	3,941	0	11,653	594,284
2029	3,932			3,932	594,284	3,932	0	11,807	602,159
2030	3,986			3,986	602,159	3,986	0	11,963	610,136
2031	3,932			3,932	610,136	3,932	0	12,124	618,328
2032	3,941			3,941	618,328	3,941	0	12,288	626,675
2033	3,986			3,986	626,675	3,986	0	12,454	635,143
2034	3,932			3,932	635,143	3,932	0	12,624	643,835
2035	3,932			3,932	643,835	3,932	0	12,798	652,701
2036	3,995			3,995	652,701	3,995	0	12,974	661,680
2037	3,932			3,932	661,680	3,932	0	13,155	670,903
2038	3,932			3,932	670,903	3,932	0	13,339	680,311
2039	3,986			3,986	680,311	3,986	0	13,526	689,851
2040	3,941			3,941	689,851	3,941	0	13,718	699,628
2041	3,932			3,932	699,628	3,932	0	13,914	709,610
2042	3,986			3,986	709,610	3,986	0	14,112	719,737
2043	3,932			3,932	719,737	3,932	0	14,316	730,121
2044	3,941			3,941	730,121	3,941	0	14,524	740,703
2045	3,986			3,986	740,703	3,986	0	14,734	751,451
2046	3,932			3,932	751,451	3,932	0	14,950	762,470
2047	3,932			3,932	762,470	3,932	0	15,171	773,709

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Status of Funding for Managing Irradiated Fuel – Vermont Yankee
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2048	3,995	3,995	773,709	3,995	0	15,394	785,108		
2049	3,932	3,932	785,108	3,932	0	15,624	796,799		
2050	3,932	3,932	796,799	3,932	0	15,857	808,725		
2051	3,986	3,986	808,725	3,986	0	16,095	820,833		
2052	3,941	3,941	820,833	3,941	0	16,338	833,230		
2053	3,770	3,770	833,230	3,770	0	16,589	846,049		
2054	3,824	3,824	846,049	3,824	0	16,844	859,069		
2055	3,770	3,770	859,069	3,770	0	17,106	872,405		
2056	3,780	3,780	872,405	3,780	0	17,373	885,998		
2057	3,824	3,824	885,998	3,824	0	17,643	899,817		
2058	3,770	3,770	899,817	3,770	0	17,921	913,967		
2059	3,770	3,770	913,967	3,770	0	18,204	928,401		
2060	3,834	3,834	928,401	3,834	0	18,491	943,059		
2061	3,770	3,770	943,059	3,770	0	18,786	958,074		
2062	3,770	3,770	958,074	3,770	0	19,086	973,390		
2063	3,824	3,824	973,390	3,824	0	19,391	988,957		
2064	3,780	3,780	988,957	3,780	0	19,704	1,004,881		
2065	3,770	3,770	1,004,881	3,770	0	20,022	1,021,133		
2066	3,824	3,824	1,021,133	3,824	0	20,346	1,037,654		
2067	3,770	3,770	1,037,654	3,770	0	20,678	1,054,562		
2068	34,428	34,428	1,054,562	34,428	0	20,403	1,040,536		
2069	76,618	76,618	1,040,536	76,618	0	19,278	983,197		
2070	109,833	109,833	983,197	109,833	0	17,467	890,831		
2071	89,271	89,271	890,831	89,271	0	16,031	817,592		
2072	89,728	89,728	817,592	89,728	0	14,557	742,420		
2073	53,202	53,202	742,420	53,202	0	13,784	703,003		
2074	551	551	703,003	551	0	14,049	716,501		
2075	318	318	716,501	318	0	14,324	730,506		
	713,385	0	0	713,385	581,539	713,385	0	862,352	730,506

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**Entergy Nuclear Operations, Inc.
Status of Funding for Managing Irradiated Fuel – Vermont Yankee
For Year Ending December 31, 2017 - 10 CFR 50.82(a)(8)(vii)**

REFERENCES:

1. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Post Shutdown Decommissioning Activities Report," BVY 14-078, dated December 19, 2014 (Accession No. ML14357A110)
2. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Decommissioning Funding Status Report per 10 CFR §50.75(f)(1) and 10 CFR 50.82(a)(8)(v) -- Entergy Nuclear Operations, Inc.," CNRO-2018-00012, dated March 29, 2018
3. Letter, Entergy Nuclear Operations, Inc. to USNRC, "Update to Irradiated Fuel Management Program Pursuant to 10 CFR 50.54(bb)," BVY14-085, dated December 19, 2014 (Accession No. ML14358A251)
4. NRC Approval of Exemption Request for Spent Fuel Management, 80 Fed. Reg. 35992 (June 23, 2015)