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December 8, 2014
L-14-303

10 CFR 72.30(b)

ATTN: Document Control Desk
Director, Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Beaver Valley Power Station, Unit No. 2
Docket No. 50-412, License No. NPF-73
Beaver Valley Power Station, Unit Nos. 1 and 2, ISFSI
Docket No. 72-1043
Decommissioning Funding Plan

Pursuant to the requirements of 10 CFR 72.30(b), FirstEnergy Nuclear Operating Company (FENOC) is submitting the Decommissioning Funding Plan for the Beaver Valley Power Station, Unit Nos. 1 and 2, Docket No. 72-1043, Independent Spent Fuel Storage Installation (ISFSI) (Attachment 1) and (Enclosure A).

To allow for normal NRC processing, FENOC requests approval of the proposed Decommissioning Funding Plan by December 31, 2015.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at 330-315-6810.

Sincerely,

Gregory H. Halnon
Director, Fleet Regulatory Affairs

Beaver Valley Power Station, Unit Nos. 1 and 2
Beaver Valley Power Station, Unit Nos. 1 and 2, ISFSI
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Attachments:

1. Decommissioning Funding Plan for Beaver Valley Power Station,
Unit Nos. 1 and 2, Independent Spent Fuel Storage Installation

Enclosure

- A. 10 CFR 72.30 ISFSI Decommissioning Cost Estimate

cc: NRC Region I Administrator
NRC Resident Inspector
NRR Project Manager
Director BRP/DEP
Site BRP/DEP Representative

Decommissioning Funding Plan for
Beaver Valley Power Station, Unit Nos. 1 and 2,
Independent Spent Fuel Storage Installation
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Pursuant to 10 CFR 72.30(b), each licensee for an independent spent fuel storage installation (ISFSI), including an ISFSI licensed under the general license provided for in 10 CFR Part 72, Subpart K, is required to submit a decommissioning funding plan for the ISFSI. FirstEnergy Nuclear Operating Company (FENOC), hereby, provides the initial decommissioning funding plan for the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS), ISFSI.

1. Information on how reasonable assurance will be provided that funds will be available to decommission the ISFSI:

The response to number 4 below discusses the appropriate method of financial assurance contemplated under 10 CFR 72.30(e).

2. A detailed cost estimate for decommissioning:

In a report dated November 21, 2014, TLG Services, Inc. (TLG) prepared a detailed plant-specific decommissioning cost estimate for the Beaver Valley Power Station, Unit Nos. 1 and 2, ISFSI. It includes cost of an independent contractor performing all decommissioning activities, an adequate contingency factor, and the cost of meeting 10 CFR 20.1402 for license termination for unrestricted use. The cost estimate assumes that Beaver Valley Power Station, Unit No. 1 will be shut down by January 29, 2036 and Beaver Valley Power Station, Unit No. 2 will be shut down by May 27, 2047 when the current licenses expire. The BVPS ISFSI cost estimate is provided in Enclosure A.

This is the initial BVPS ISFSI decommissioning funding plan; therefore, there is no impact with respect to the following four criterion listed in 10 CFR 72.30(c):

1. Spills of radioactive material producing additional residual radioactivity in onsite subsurface material: N/A
2. Facility modifications: N/A
3. Changes in authorized possession limits: N/A
4. Actual remediation costs that exceed the previous cost estimate: N/A

3. Identification of and justification for using the key assumptions contained in the decommissioning cost estimate:

The decommissioning cost estimate key assumptions and their justifications are provided in the plant-specific decommissioning cost estimate for the BVPS ISFSI (Enclosure A).

4. A description of the method of assuring funds for decommissioning from 10 CFR 72.30(e), including means for adjusting cost estimates and associated funding levels periodically over the life of the facility:

Financial assurance in the amount of \$8,018,000 for the decommissioning of the BVPS ISFSI is provided through two ISFSI decommissioning parent guarantees totaling \$23 million (Accession No. ML14183B295). These guarantees will be payable to the existing nuclear decommissioning trust funds established for Beaver Valley Power Station pursuant to the nuclear decommissioning master trust agreements. The guarantees will provide for the ISFSI decommissioning amounts to be deposited into a separate subaccount to be maintained by the Trustee.

10 CFR 30, Appendix A, "Criteria Relating to Use of Financial Tests and Parent Company Guarantees for Providing Reasonable Assurance of Funds for Decommissioning," provides guidance for establishing parent guarantees to provide assurance for decommissioning funding. The test includes the current cost estimate for decommissioning and the amount to be guaranteed. The regulation requires the test to be performed annually. The performance of the test, with the current decommissioning cost estimate, provides information such that the values of the parent guarantees can be adjusted to ensure that adequate funding will be available to decommission the ISFSI.

5. The volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination:

The Standardized NUHOMS® Horizontal Modular Storage System for Irradiated Nuclear Fuel Docket No. 72-1004 Amendment No. 13 has been evaluated to be leak tight; therefore, no discernable leakage is credible. It is not expected that there will be any residual contamination on the ISFSI pad, the horizontal storage modules, the cask transporter, or other facilities at the Beaver Valley ISFSI. FENOC assumes the volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination to be zero.

6. A certification that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning:

The submission of this report in conjunction with the two ISFSI decommissioning parent guarantees totaling \$23 million (Accession No. ML14183B295) serves as certification that financial assurance has been provided in the amount of the cost estimate for decommissioning.

Enclosure A
L-14-303

10 CFR 72.30 ISFSI Decommissioning Cost Estimate
(6 Pages Follow)

10 CFR 72.30 ISFSI Decommissioning Cost Estimate

1. Background and Introduction

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

In accordance with the rule, this letter provides a detailed cost estimate for decommissioning the ISFSI at Beaver Valley Power Station (Beaver Valley) in an amount reflecting:

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

This letter also provides:

1. Identification of the key assumptions contained in the cost estimate; and
2. The volume of onsite subsurface material containing residual radioactivity, if any, that will require remediation to meet the criteria for license termination.

2. Spent Fuel Management Strategy

Beaver Valley's operating licenses were renewed effective November 9, 2009. The scheduled license termination dates for Beaver Valley Units 1 and 2 are January 29, 2036, and May 27, 2047, respectively. Currently, 5,010 spent fuel assemblies are projected to be discharged over the operating life of the two units. If DOE is able to initiate acceptance of commercial spent fuel in 2025, 2,346 assemblies are projected to be shipped during plant operations or within seven years following the cessation of operations (during which time the spent fuel pools are operational). For the purpose of this analysis, the remaining 2,664 assemblies would be placed in dry storage at an on-site ISFSI. The ISFSI would operate (under a Part 50 General License) until the transfer of spent fuel to the DOE is completed. At that time, the ISFSI could be decommissioned.

¹ U.S. Code of Federal Regulations, Title 10, Parts 20, 30, 40, 50, 70 and 72 "Decommissioning Planning," Nuclear Regulatory Commission, Federal Register Volume 76, Number 117 (p 35512 et seq.), June 17, 2011.

Completion of the ISFSI decommissioning process is dependent upon the DOE's ability to remove spent fuel from the site. DOE's repository program assumes that spent fuel allocations will be accepted for disposal from the nation's commercial nuclear plants, with limited exceptions, in the order (the "queue") in which it was discharged from the reactor.^[2] FirstEnergy Corporation's current spent fuel management plan for the Beaver Valley spent fuel is based in general upon completion of spent fuel receipt by no later than the year 2075.

3. ISFSI Decommissioning Strategy

At the conclusion of the spent fuel transfer process the ISFSI can be decommissioned by removing and disposing of residual radioactivity and verifying that remaining materials satisfy NRC release criteria.

For purposes of providing an estimate for a funding plan, financial assurance is expected to be provided on the basis of a prompt ISFSI decommissioning scenario. In this estimate the ISFSI decommissioning is considered an independent project, regardless of the decommissioning alternative identified for the nuclear power plant.

4. ISFSI Description

The Beaver Valley ISFSI currently uses a Transnuclear NUHOMS system (with a 37-fuel assembly capacity) for spent fuel storage. The system consists of a multi-purpose (storage and transport) dry shielded storage canister (DSC) and a horizontal storage module (HSM). The DSCs are assumed to be transferred directly to the DOE and not returned to the station. Some of the remaining HSMs are assumed to have residual radioactivity due to some minor level of neutron-induced activation as a result of the long-term storage of the spent fuel. The cost to dispose of residual radioactivity, and verify that the remaining facility and surrounding environs meet the NRC's radiological limits established for unrestricted use, form the basis of the ISFSI decommissioning estimate.

In addition to the spent fuel casks located on the ISFSI pad after shutdown there may be additional casks used for Greater-than-Class-C (GTCC) storage. The HSMs used to store the GTCC canisters (estimated quantity of 8) are not expected to have any interior contamination or residual activation and can be reused or disposed of by conventional means after a final status survey.

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

² U.S. Code of Federal Regulations, Title 10, Part 961.11, Article IV – Responsibilities of the Parties, B. DOE Responsibilities, 5.(a) "... DOE shall issue an annual acceptance priority ranking for receipt of SNF and/or HLW at the DOE repository. This priority ranking shall be based on the age of SNF and/or HLW as calculated from the date of discharge of such materials from the civilian nuclear power reactor. The oldest fuel or waste will have the highest priority for acceptance, except as ..."

5. Key Assumptions / Estimating Approach

The decommissioning estimate is based on the configuration of the ISFSI at the cessation of plant operations (Beaver Valley Unit 2 operating until 2047, and the assumptions associated with DOE's spent fuel acceptance, as previously described).

The nominal size of the ISFSI pad to store the projected amount of spent fuel is expected to be approximately 90 feet in width, and 400 feet in length.

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

It is not expected that the HSMs will have any interior or exterior radioactive surface contamination. It is expected that this assumption would be confirmed as a result of good radiological practice of surveying potentially impacted areas after each spent fuel transfer campaign. Any neutron activation of the steel and concrete is expected to be extremely small. To validate this assumption, the estimate accounts for further characterization of 10% of the HSMs; it is likely that some of this characterization will take place well before the last of the fuel is removed from the ISFSI in order to establish a more definitive decommissioning scope.

The decommissioning estimate conservatively assumes that 10 HSMs (equivalent to the number of casks to store the final full core offloads for both units) will contain low levels of neutron-induced residual radioactivity that would necessitate remediation at the time of decommissioning. For purposes of this estimate, these HSMs are designated for controlled disposal as low-level radioactive waste.

It is not expected that there will be any residual contamination left on the concrete ISFSI pad once the HSMs are removed, the cask transporter, or other facilities at the Beaver Valley ISFSI. It is expected that these assumptions would be confirmed as a result of good radiological practice of surveying potentially impacted areas after each spent fuel transfer campaign. As such, only verification surveys are included for the other facilities in the decommissioning estimate.

The ISFSI was constructed upon part of the property that was released as a result of the decommissioning of the Shippingport Atomic Power Station by the U.S. Department of Energy in 1989. The pad area was excavated down approximately 15 feet, and backfilled with clean engineered fill. The surrounding ISFSI areas were not disturbed, and remain as left by the DOE, other than a topcoat of gravel. As such, the decommissioning estimate assumes that no soil remediation is required^[3], to meet the unrestricted use criteria of 10 CFR 20.1402.

³ Email Matt Minniti to Francis Seymore, November 18, 2014.

Decommissioning is assumed to be performed by an independent contractor. As such, essentially all labor, equipment, and material costs are based on national averages, i.e., costs from national publications such as R.S. Means' Building Construction Cost Data (adjusted for regional variations), and laboratory service costs are based on vendor price lists. Those craft labor positions are expected to be provided locally. FirstEnergy Corporation, as licensee, will oversee the site activities; the estimate includes FirstEnergy Corporation's labor and overhead costs.

Low-level radioactive waste packaging and transport costs are based on industry data. Disposal costs are based on FirstEnergy Corporation's existing contracted disposal rates.

Costs are reported in 2014 dollars.

Contingency has been added at an overall rate of 25%. This is consistent with the contingency evaluation criteria referenced by the NRC in NUREG-1757.^[4]

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

6. Cost Estimate

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

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

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

For estimating purposes it should be conservatively assumed that all expenditures will be incurred in the year 2076, the year following the last of the spent fuel removal.

⁴ "Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping, and Timeliness," U.S. Nuclear Regulatory Commission's Office of Nuclear Material Safety and Safeguards, NUREG-1757, Volume 3, Revision 1, February 2012.

Table 1
Significant Quantities and Physical Dimensions

ISFSI Pad

Item	Length (ft)	Width (ft)	Residual Radioactivity
ISFSI Pad (dimensions are for current pad)	300	90	No
ISFSI Pad Expansion (dimensions are for expansion)	100	90	No

ISFSI Horizontal Storage Modules

Item	Value	Notes (all dimensions are nominal)
Overall Length (inches)	248	HSM dimensions based upon
Overall Width (inches)	116	Transnuclear HSM-H design
Overall Height (inches)	222	
Quantity (total)	72	
Quantity (with residual radioactivity)	10	Equivalent to the number of HSMs needed to store the last core offloads from both units at Beaver Valley
Total Surface Area of HSM interior with Residual Radioactivity (square feet)	7,500	
Low-Level Radioactive Waste (cubic feet)	21,853	
Low-Level Radioactive Waste (packaged density)	151	Most weight shipped as concrete slabs

Other Potentially Impacted Items

Item	Value	Notes
Cask Transporter	1	No residual radioactivity
ISFSI Equipment Storage Building	1	No residual radioactivity
Number of HSMs used for GTCC storage	8	No residual radioactivity

Table 2
ISFSI Decommissioning Costs¹ and Waste Volumes

	(Thousands, 2014 dollars)							Waste Volume (ft3)	Person-Hours	
	Decon	Removal	Packaging	Transport	Disposal	Other	Total		Craft	Oversight and Contractor
Decommissioning Contractor										
Planning (characterization, specs and procedures)		-	-	-	-	218	218	-	-	1,096
Remediation (activated HSMs)		250	4	853	2,106	528	3,741	21,853	2,092	-
License Termination (radiological surveys)		-	-	-	-	1,186	1,186	-	9,234	-
Subtotal		250	4	853	2,106	1,932	5,145	21,853	11,327	1,096
Supporting Costs										
NRC and NRC Contractor Fees and Costs		-	-	-	-	384	384	-	-	776
Insurance		-	-	-	-	65	65	-	-	-
Property taxes		-	-	-	-	331	331	-	-	-
Corporate A&G		-	-	-	-	82	82	-	-	-
Security (industrial)		-	-	-	-	148	148	-	-	5,020
FirstEnergy Corporation Oversight Staff		-	-	-	-	259	259	-	-	3,803
Subtotal		-	-	-	-	1,270	1,270	-	-	9,599
Total (w/o contingency)		250	4	853	2,106	3,202	6,415	21,853	11,327	10,695
Total (w/25% contingency)							8,018			

Note 1: For funding planning purposes decommissioning costs can be assumed to be incurred in year 2076