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NRC-17-0023

10 CFR 72.30

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

References: 1) Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

Subject: Fermi 2 ISFSI Decommissioning Funding Plan Update

DTE Electric Company has prepared a decommissioning funding plan update and cost estimate for the Fermi 2 Independent Spent Fuel Storage Installation (ISFSI) pursuant to 10 CFR 72.30(b). As required by 10 CFR 72.30(c), the decommissioning funding plan must be updated at intervals not to exceed 3 years and at the time a renewed license is issued. DTE Electric Company was issued a renewed license for Fermi 2 on December 15, 2016.

Enclosure 1 provides the updated Fermi 2 ISFSI decommissioning funding plan. Enclosure 2 provides the decommissioning cost estimate for the Fermi 2 ISFSI. The enclosed updated funding plan and cost estimate contain the information required by 10 CFR 72.30 to provide reasonable assurance that funds will be available to decommission the Fermi 2 ISFSI. This letter constitutes certification that financial assurance is provided to cover the estimated costs of ISFSI decommissioning per 10 CFR 72.30(b)(6).

Should you have any questions or require additional information, please contact Lynne Goodman at 734-586-1205.

No new commitments are being made in this submittal.

Sincerely,



Keith J. Polson
Site Vice President

Enclosures: 1. Fermi 2 ISFSI Decommissioning Funding Plan Update
2. Fermi 2 ISFSI Decommissioning Cost Estimate

cc: NRC Project Manager
NRC Resident Office
Reactor Projects Chief, Branch 5, Region III
Regional Administrator, Region III
Michigan Public Service Commission
Regulated Energy Division (kindschl@michigan.gov)

**ENCLOSURE 1
TO
NRC-17-0023**

**Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43**

Fermi 2 ISFSI Decommissioning Funding Plan Update

Fermi 2 ISFSI Decommissioning Funding Plan Update

Introduction

An Independent Spent Fuel Storage Installation (ISFSI) is a facility that is designed and constructed for the interim storage of spent nuclear fuel. Solid reactor-related greater than Class C (GTCC) waste and other radioactive materials associated with spent fuel and reactor-related GTCC waste storage may also be stored at an ISFSI. The licensing requirements for ISFSI are specified in 10 Code of Federal Regulations (CFR) 72. Subpart 72.30 requires a decommissioning plan that provides reasonable assurance that the decontamination and decommissioning of the ISFSI at the end of its useful life will provide adequate protection to the health and safety of the public. This document provides the information required by 10 CFR 72.30.

Decommissioning Funding Plan for Fermi 2 ISFSI

A decommissioning funding plan consisting of detailed information is required in 10 CFR 72.30(b). Each of the required items from 10 CFR 72.30(b) are discussed in detail below.

- *Requirement 1: Information on how reasonable assurance will be provided that funds will be available to decommission the ISFSI*
A plant-specific decommissioning cost estimate has been prepared for the Fermi 2 ISFSI. The total estimated decommissioning cost is found in Table 2 of Enclosure 2 of this letter. The cost estimate assumes that Fermi 2 will be shut down by March 20, 2045 when the renewed license expires. Prior to the approval of the license extension for Fermi 2, the required funding per year was calculated such that full funding would be available by the end of the original license, March 20, 2025. The result was approximately \$710,000 per year. This deposit amount has not been adjusted since the renewed license was issued and calculations show an excess of approximately \$328,000 per year is being deposited into the ISFSI decommissioning fund account based on license termination in 2045. The ISFSI decommissioning fund account deposit amount will be reviewed in the future and may be adjusted to ensure at least the required annual amount of approximately \$382,000 is deposited based on license termination in 2045. To achieve the required funding per year, monthly deposits will be made into a separate account for ISFSI decommissioning within the Nuclear Decommissioning Trust Fund (NDT) for Fermi 2. The amount deposited per month is based on electricity sales and will vary from month to month. The performance of the ISFSI account within the NDT Fund will be evaluated periodically and deposits adjusted as appropriate. A report will be submitted to the NRC at least once every three years to address the adequacy of the ISFSI decommissioning funding (see discussion of 10 CFR 72.30(c) below).
- *Requirement 2: Detailed cost estimate for decommissioning*
A detailed plant-specific decommissioning cost estimate has been prepared for the Fermi 2 ISFSI and is presented in Enclosure 2 to this letter. It includes the cost of an independent contractor performing all decommissioning activities, an adequate contingency factor, and the cost of meeting the 10 CFR 20.1402 criteria for unrestricted use. Note that the cost estimate was prepared in 2014 prior to receipt of the renewed license, but is based on the assumption that Fermi 2 will be shut down by March 20, 2045, consistent with the renewed license as discussed above.

- *Requirement 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 Fermi 2 ISFSI. See Enclosure 2 to this letter.
- *Requirement 4: Description of the method of assuring funds for decommissioning, including means for adjusting cost estimates and associated funding levels periodically over the life of the facility*
DTE Electric Company is a licensee under 10 CFR 50 and a regulated electric utility. Therefore, as allowed per 10 CFR 72.30(e)(5), the methods of 10 CFR 50.75(e) may be used. Specifically, the Fermi 2 ISFSI decommissioning funding plan utilizes an external sinking fund as described in 10 CFR 50.75(e)(1)(ii)(A) and (B). The Fermi 2 ISFSI decommissioning funding is collected from customers in rates and fees. The calculation for funding required per year assumes net earnings of 1%. This is consistent with assumptions used in DTE Electric Company's rate case submitted to the Michigan Public Service Commission and is conservative compared to the 2% assumption allowed in 10 CFR 50.75. The funds for ISFSI decommissioning are being placed in a separate account in the Fermi 2 NDT Fund. Currently the account holds approximately \$2.2 million. The State Street Bank and Trust Company is the current trustee. The cost estimate of \$8.6M in 2014 dollars shown in Enclosure 2, Table 2 was escalated to \$8.9M in 2016 dollars using the 2015 and 2016 Consumers Price Index (CPI).
- *Requirement 5: Volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination*
The decommissioning cost estimate assumptions for material that will need to be remediated and the volume of waste are provided in the plant-specific decommissioning cost estimate for the Fermi 2 ISFSI (Enclosure 2 to this letter).
- *Requirement 6: Certification that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning*
This signed letter provides certification that DTE Electric Company will provide financial assurance for decommissioning the Fermi 2 ISFSI in the amount indicated in Table 2 of Enclosure 2 of the letter.

Updates to Decommissioning Funding Plan for Fermi 2 ISFSI

Updates to the decommissioning funding plan are required per 10 CFR 72.30(c). The Fermi 2 ISFSI decommissioning funding plan will be updated and submitted at intervals not to exceed 3 years. The updates will consider the effect of potential events such as spills of radioactive material producing additional residual radioactivity in onsite subsurface material, facility modifications, changes in authorized possession limits, and actual remediation costs that exceed the previous cost estimate. In addition to these recurring updates, 10 CFR 72.30(c) also requires an update to be submitted at the time of license renewal. DTE Electric Company was issued a renewed license on December 15, 2016, and as a result the ISFSI decommissioning funding plan has been reassessed in this submittal to take into account the period of extended operation.

**ENCLOSURE 2
TO
NRC-17-0023**

**Fermi 2 NRC Docket No. 50-341
Operating License No. NPF-43**

Fermi 2 ISFSI Decommissioning Cost Estimate

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 Fermi 2 Nuclear Power Plant (Fermi 2) 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, and

2. Spent Fuel Management Strategy

If the plant receives a 20-year license renewal, the renewed operating license for Fermi 2 would be projected to expire on March 20, 2045. For planning purposes it is projected that up to 96 spent fuel storage casks are required to store approximately 6,528 assemblies. The ISFSI is operated under a Part 50 General License.

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

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

reactor.^[2] DTE Energy's current spent fuel management plan for the Fermi 2 spent fuel is based in general upon completion of spent fuel receipt by no later than year 2054.

3. ISFSI Decommissioning Strategy

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

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

4. ISFSI Description

The Fermi 2 ISFSI uses a Holtec International (Holtec) HI-STORM 100 dry storage system (nominal 68 assemblies per cask). The HI-STORM 100 is comprised of a multi-purpose canister (MPC) and storage overpack. The multi-purpose canisters are assumed to be transferred directly to the DOE and not returned to the station. The remaining overpacks 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 storage overpacks used for the GTCC canisters (estimated quantity of 4) 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 expected after all spent fuel and GTCC material has been removed from the site. The configuration of the ISFSI is based on the unit operating until the end of a 20-year renewed license, or March 20, 2045, and the assumptions associated with DOE's spent fuel acceptance, as previously described.

The nominal size of the ISFSI pad is sufficient to store the projected amount of spent fuel and is expected to be approximately 141 feet in width, and 209 feet in length.

It is not expected that the overpacks will have any interior or exterior radioactive surface contamination. It is expected that this assumption would be confirmed as a result of good radiological practice of surveying potentially impacted areas after each spent fuel transfer campaign. Any neutron activation of the steel and concrete is expected to be extremely small. To validate this assumption, the estimate accounts for characterization of 10% of the overpacks; 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 12 overpacks (equivalent to the number of casks to store the final full core offload) will contain low levels of neutron-induced residual radioactivity that would necessitate remediation at the time of decommissioning. For purposes of this estimate, the overpacks are designated for controlled disposal as low-level radioactive waste.

It is assumed that a small amount of residual contamination will be present at the in-ground cask transfer facility and the lifting cable assemblies of the HI-TRAC vertical cask transporter at the time of decommissioning. It is not expected that there will be any residual contamination left on the concrete ISFSI pad, or other facilities at the Fermi 2 ISFSI, including the ISFSI fabrication pad. 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. Therefore, it is assumed for this analysis that only the in-ground cask transfer facility and certain components of the HI-TRAC transporter will be contaminated. As such, only verification surveys are included for the other facilities in the decommissioning estimate.

There is no known^[3] subsurface material (soil contamination) in the proximity of the ISFSI containing residual radioactivity that will require remediation to meet the criteria for license termination.

To support an application for License Termination, the estimate assumes that a Final Status Survey will be performed; this will include a 100% survey of the concrete

³ Email Lynne Goodman to Francis Seymore, April 30, 2014.

overpack surfaces, and a significant fraction of the ISFSI pad and the immediate area surrounding the pad, and the other ISFSI structures.

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 that are expected to be provided locally. DTE Energy, as licensee, will oversee the site activities; the estimate includes DTE Energy's labor and overhead costs.

Low-level radioactive waste packaging and transport costs are based on industry data. Disposal costs are based on DTE Energy'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 overpacks 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 at 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), DTE Energy'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 2054, the year following all 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, September 2003

Table 1
Significant Quantities and Physical Dimensions

ISFSI Pad

Item	Length (ft)	Width (ft)	Residual Radioactivity
ISFSI Pad (dimensions are for current pad)	141	141	No
ISFSI Pad Expansion (dimensions are for expansion)	141	68	No

ISFSI Overpack

Item	Value	Notes (all dimensions are nominal)
Overall Height (inches)	224	Dimensions are nominal
Outside Diameter (inches)	133.90	Main cylindrical body of overpack
Inside Diameter (inches)	73.50	Dimensions are nominal
Inner Liner Thickness (inches)	1.25	Dimensions are nominal
Quantity (total)	96	
Quantity (with residual radioactivity)	12	Equivalent to the number of overpacks used to store last complete core offload
Total Surface Area of Overpack Inner Liner with Residual Radioactivity (square feet)	4,467	
Low-Level Radioactive Waste (cubic feet)	25,083	
Low-Level Radioactive Waste (packaged density)	82	

Other Potentially Impacted Items

Item	Value	Notes
In-Ground Cask Transfer Facility	1	Small amount of residual activity
HI-TRAC Vertical Cask Transporter	1	Small amount of residual activity
ISFSI Equipment Storage Building	1	No residual radioactivity
Number of Overpacks used for GTCC storage	4	No residual radioactivity

Table 2
ISFSI Decommissioning Costs¹ and Waste Volumes

		(Thousands, 2014 dollars)								Person-Hours	
	Decon	Removal	Packaging	Transport	Disposal	Other	Total	Waste Volume (ft3)	Craft	Oversight and Contractor	
Decommissioning Contractor											
Planning (characterization, specs and procedures)							332.0	332.0			1,144.0
Remediation (activated liner removal)		300.0	314.5	581.5	2,505.6	17.1	3,718.7	25,056.0	3,115.5		
Remediation (Cask Transfer Facility / HI-TRAC Vertical Transporter)	9.5	19.2	5.0	21.7	21.7	1.9	79.0	217.0	441.5		
License Termination (radiological surveys)							1,564.0	1,564.0		12,806.4	
Subtotal	9.5	319.2	319.5	603.2	2,527.3	1,915.0	5,693.7	25,273.0	16,363.4		1,144.0
Supporting Costs											
NRC and NRC Contractor Fees and Costs							383.7	383.7			776.0
Insurance							103.0	103.0			
Energy Budget							75.8	75.8			
Corporate A&G							219.9	219.9			
Security (industrial)							193.9	193.9			5,119.7
DTE Energy Oversight Staff							212.7	212.7			3,883.9
Subtotal							1,189.0	1,189.0			9,779.6
Total (w/o contingency)	9.5	319.2	319.5	603.2	2,527.3	3,104.0	6,882.7	25,273.0	16,363.4		10,923.6
Total (w/25% contingency)	11.9	399.0	399.4	754.0	3,159.1	3,880.0	8,603.4				

Note 1: For funding planning purposes decommissioning costs can be assumed to be incurred in year 2054