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10 CFR 50.54(f)

December 9, 2016
NRC-16-0067

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
 - 2) NRC Letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012 (ADAMS Accession Number ML12053A340)
 - 3) NRC Letter, Final Determination of Licensee Seismic Probabilistic Risk Assessments Under the Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 2.1 "Seismic" of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated October 27, 2015 (ADAMS Accession Number ML15194A015)
 - 4) NEI Letter, Request for Endorsement of Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation (EPRI 3002007148), dated February 23, 2016 (ADAMS Accession Number ML16055A017)
 - 5) EPRI 3002007148, Seismic Evaluation Guidance Spent Fuel Pool Integrity Evaluation, February 2016
 - 6) NRC Letter, Endorsement of Electric Power Research Institute Report 3002007148, "Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation," dated March 17, 2016 (ADAMS Accession Number ML15350A158)
 - 7) DTE Electric Company (DTE) Letter NRC-14-0017, DTE Electric Company's Seismic Hazard and Screening Report Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 31, 2014 (ADAMS Accession Number ML14090A326)

- 8) NRC Letter, Fermi, Unit 2 - Staff Assessment of Information provided Pursuant to Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima DAI-ICHI Accident (TAC No. MF3861), dated October 5, 2015 (ADAMS Accession Number ML15077A028)
- 9) EPRI 1025287, Seismic Evaluation Guidance, Screening, Prioritization and Implementation Details [SPID] for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic, February 2013
- 10) DTE Report, Fermi 2 Updated Final Safety Analysis Report, Revision 20, May 2016 (ADAMS Accession Number ML16165A442)

Subject: Spent Fuel Pool Evaluation Supplemental Report, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued a Request for Information per 10 CFR 50.54(f) (Reference 2) to all power reactor licensees. Enclosure 1, Item (9), of the 50.54(f) letter requested addressees to provide limited scope spent fuel pool (SFP) evaluations. By letter dated October 27, 2015 (Reference 3), the NRC transmitted final seismic information request tables, which identified that DTE Electric Company (DTE) is to conduct a limited scope SFP Evaluation. By Reference 4, the Nuclear Energy Institute (NEI) submitted an Electric Power Research Institute (EPRI) report entitled "Seismic Evaluation Guidance Spent Fuel Pool Integrity Evaluation (EPRI 3002007148)" (Reference 5) for NRC review and endorsement. NRC endorsement was provided by Reference 6.

EPRI 3002007148 provides criteria for evaluating the seismic adequacy of a SFP to the reevaluated ground motion response spectrum (GMRS) hazard levels. The report supplements the guidance in the Seismic Evaluation Guidance, Screening, Prioritization and Implementation Details (SPID) (Reference 9), for plants where the GMRS peak spectral acceleration is less than or equal to 0.8g. Section 3.3 of EPRI 3002007148 lists the parameters to be verified to confirm that the results of the report are applicable to DTE, and that the Fermi, Unit 2 (Fermi 2) SFP is seismically adequate in accordance with NTF 2.1 Seismic evaluation criteria.

The enclosure to this letter provides the data for Fermi 2 that confirms applicability of the EPRI 3002007148 criteria, confirms that the SFP is seismically adequate, and provides the requested information in response to Item (9) of the 50.54 (f) letter

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associated with Near-Term Task Force (NTTF) Recommendation 2.1 Seismic evaluation criteria.

No new commitments are being made in this submittal.

Should you have any questions or require additional information, please contact Mr. Scott A. Maglio, Manager – Nuclear Licensing, at (734) 586-5076.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on December 9, 2016



Keith J. Polson
Site Vice President

Enclosure: Site-Specific Spent Fuel Pool Criteria for Fermi 2

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 to
NRC-16-0067**

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

Site-Specific Spent Fuel Pool Criteria for Fermi 2

Site-Specific Spent Fuel Pool Criteria for Fermi 2

The U.S. Nuclear Regulatory Commission (NRC) requested that, in conjunction with the response to Near-Term Task Force (NTTF) Recommendation 2.1 (Reference 2), a seismic evaluation be made of the spent fuel pool (SFP). Plants were asked to consider “all seismically induced failures that can lead to draining of the SFP.” This evaluation is required for any plant in which the ground motion response spectrum (GMRS) exceeds the safe shutdown earthquake (SSE) in the 1 to 10 Hertz (Hz) frequency range. The NRC confirmed that the GMRS exceeds the SSE and concluded that a SFP evaluation is merited for the Fermi 2 site (References 3 and 8). By letter dated March 17, 2016 (Reference 6), the NRC determined that Electric Power Research Institute (EPRI) report 3002007148 was an acceptable approach for performing SFP evaluations for plants where the peak spectral acceleration is less than or equal to 0.8g.

The table below lists the criteria from Section 3.3 of EPRI 3002007148 along with data for Fermi 2 that confirms applicability of the EPRI 3002007148 criteria and confirms that the SFP is seismically adequate and can retain adequate water inventory for 72 hours in accordance with NTTF 2.1 Seismic evaluation criteria.

SFP Criteria from EPRI 3002007148	Site-Specific Data
Site Parameters	
1. The site-specific GMRS peak spectral acceleration at any frequency should be less than or equal to 0.8g.	The GMRS peak spectral acceleration in the NTTF 2.1 Seismic Hazard and Screening Report for Fermi 2 (Reference 7), as accepted by the NRC in NRC letter dated October 5, 2015 (Reference 8), is 0.32g, which is less than 0.8g. Therefore, this criterion is met.
Structural Parameters	
2. The structure housing the SFP should be designed using an SSE with a peak ground acceleration (PGA) of at least 0.1g.	The SFP is housed in the Reactor Building, which is seismically designed to the site SSE with a PGA of 0.15g. The Fermi 2 PGA is greater than 0.1g. Therefore, this criterion is met.
3. The structural load path to the SFP should consist of some combination of reinforced concrete shear wall elements, reinforced concrete frame elements, post-tensioned concrete elements and/or structural steel frame elements.	The structural load path from the foundation to the SFP consists of reinforced concrete shear wall elements. The pool walls themselves are reinforced concrete shear walls as described in Section 9.1.2.2.1 of the Updated Final Safety Analysis Report (UFSAR) (Reference 10). Load is transferred to the foundation via the multiple supporting reinforced concrete shear walls. The full load path can be traced in UFSAR Figures 3.7-12, 3.8-27, 3.8-28, and 3.8-40 (Reference 10). Therefore, this criterion is met.

SFP Criteria from EPRI 3002007148	Site-Specific Data
Structural Parameters (cont.)	
4. The SFP structure should be included in the Civil Inspection Program performed in accordance with Maintenance Rule.	The SFP structure is included in the Fermi 2 Civil Inspection Program in accordance with 10 CFR 50.65, which monitors the performance or condition of structures, systems, or components (SSCs) in a manner sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended functions. Therefore, this criterion is met.
Non-Structural Parameters	
5. To confirm applicability of the piping evaluation in Section 3.2 of EPRI 3002007148, piping attached to the SFP up to the first valve should have been evaluated for the SSE.	Piping attached to the SFP is evaluated to the SSE in accordance with the Fuel Pool Cooling and Cleanup System (FPCCS) Design Specification and UFSAR Section 3.7 (Reference 10). All lines that penetrate the pool are Seismic Category I or Seismic Category II/I, which is part of the SSE piping analysis. This piping qualification extends at least up to the first isolation valve for all piping penetrating the pool. Therefore, this criterion is met.
6. Anti-siphoning devices should be installed on any piping that could lead to siphoning water from the SFP. In addition, for any cases where active anti-siphoning devices are attached to 2-inch or smaller piping and have extremely large extended operators, the valves should be walked down to confirm adequate lateral support.	<p>Two 6 inch (in) lines penetrate the pool liner and discharge into the pool as part of the Pool Clean-Up Supply. Each line enters the pool 1 foot (ft) below the water surface and terminates 8 ft 6 in below the water surface. Each of these lines has passive siphon breakers at a depth of 1 ft below the normal water level. It is therefore not possible to siphon more than 1 ft of the pool inventory. There is 21 ft-6 in of water between the elevation of the siphon breakers and the top of the fuel (reference plant drawings C-2419, M-3356, M-3357, and UFSAR Figures 9.1-3, 9.1-23). No other lines penetrate the pool or the liner. A weir at the top of pool water level serves as the outlet for the FPCCS. No lines penetrate into the water from here, so siphoning from the weir is not possible.</p> <p>Anti-siphoning devices are installed on all SFP piping that could lead to siphoning. Additionally, all anti-siphoning devices are passive. There are no active anti-siphoning devices necessary for the Fermi 2 SFP. No anti-siphoning devices are attached to 2-inch or smaller piping with extremely large extended operators. Therefore, this criterion is met.</p>

SFP Criteria from EPRI 3002007148	Site-Specific Data
Non-Structural Parameters (cont.)	
<p>7. To confirm applicability of the sloshing evaluation in Section 3.2 of EPRI 3002007148, the maximum SFP horizontal dimension (length or width) should be less than 125 ft, the SFP depth should be greater than 36 ft, and the GMRS peak spectral acceleration (Sa) should be <0.1g at frequencies equal to or less than 0.3 Hz.</p>	<p>The Fermi 2 SFP has a length of 40 ft, a width of 34 ft and a depth of 38 ft 9 in based on the UFSAR Section 9.1.2.2.1 (Reference 10).</p> <p>The Fermi 2 GMRS maximum spectral acceleration in the frequency range equal to or less than 0.3 Hz is 0.025g from the Seismic Hazard and Screening Report (Reference 7), which is less than 0.1g.</p> <p>Therefore, this criterion is met.</p>
<p>8. To confirm applicability of the evaporation loss evaluation in Section 3.2 of EPRI 3002007148, the SFP surface area should be greater than 500 ft² and the licensed reactor core thermal power should be less than 4,000 MWt per unit.</p>	<p>The surface area of the Fermi 2 SFP is 1,360 ft², which is greater than 500 ft²; and licensed reactor thermal power for Fermi 2 is 3,486 MWt, which is less than 4,000 MWt per unit.</p> <p>Therefore, this criterion is met.</p>