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February 21, 2018  
NRC-18-0016

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

Fermi 2 Power Plant  
NRC Docket No. 50-341  
NRC License No. NPF-43

Subject: Response to Request for Additional Information (Set 2) Regarding License Amendment Request to Revise Technical Specifications to Eliminate Main Steam Line Radiation Monitor Reactor Trip and Primary Containment Isolation System Group 1 Isolation Functions

- References:
- 1) DTE Electric Letter to NRC, "License Amendment Request to Revise Technical Specifications to Eliminate Main Steam Line Radiation Monitor Reactor Trip and Primary Containment Isolation System Group 1 Isolation Functions," NRC-17-0012, dated August 24, 2017 (ML17237A176)
  - 2) NRC Letter to DTE, "Fermi 2 - Supplemental Information Needed for Acceptance of Requested Licensing Action RE: License Amendment Request to Revise Technical Specifications to Eliminate Main Steam Line Radiation Monitor Reactor Trip and Primary Containment Isolation System Group 1 Isolation Functions (CAC No. MG0228; EPID L-2017-LLA-0274)," dated October 10, 2017 (ML17271A220)
  - 3) DTE Electric Letter to NRC, "Supplemental Information Regarding License Amendment Request to Eliminate Main Steam Line Radiation Monitor Reactor Trip and Primary Containment Isolation System Group 1 Isolation Functions," NRC-17-0066, dated October 18, 2017 (ML17298A185)

In Reference 1, DTE Electric Company (DTE) submitted a license amendment request (LAR) to revise the Fermi 2 Technical Specifications (TS) to eliminate the main steam line radiation monitor (MSLRM) reactor trip and primary containment isolation system (PCIS) Group 1 isolation functions. Supplemental information was

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requested by the NRC in Reference 2 and DTE subsequently submitted a supplement to the LAR in Reference 3. In an email from Ms. Sujata Goetz to Mr. Jason Haas dated January 29, 2018, the NRC sent DTE a request for additional information (RAI) regarding this LAR. The response to the RAI is enclosed.

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 February 21, 2018



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Enclosure: Response to Request for Additional Information

cc: NRC Project Manager  
NRC Resident Office  
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Regional Administrator, Region III  
Michigan Public Service Commission  
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**Enclosure to  
NRC-18-0016**

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

**Response to Request for Additional Information**

## **Response to Request for Additional Information**

*By application dated August 24, 2017, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17237A176), DTE Energy Company (DTE or licensee) requested to revise Fermi 2 technical specifications (TS) to eliminate the main steam line radiation monitor (MSLRM) reactor trip and Primary Containment Isolation System (PCIS) Group 1 Isolation Functions. The NRC staff has reviewed the information provided by the licensee in support of the proposed license amendment and the staff requests additional information.*

### **SRXB RAI-1**

*The August 24, 2017, application requests elimination of MSLRM functions for initiating: 1) a reactor protection system (RPS) automatic reactor trip and 2) the associated (Group 1) primary containment isolation system (PCIS) automatic closure of the main steam isolation valves (MSIVs) and main steam line (MSL) drain valves. The licensee's justifications for eliminating the MSLRM trip and isolation functions are based on the approach documented in the Boiling Water Reactor Owners Group (BWROG) General Electric (GE) Licensing Topical Report NEDO-31400A.*

- a. In addition to the control rod drop accident (CRDA) analysis, are there other MSLRM trip function credited for other accident or transient analyses at Fermi 2? If so, discuss the events, including any plan to eliminate the trip function and resulting impacts on the outcome for those events.*
- b. The proposed TS changes requirements for the MSLRM trip function from the Fermi TS Table 3.3.1.1-1, "Reactor Protection System Instrumentation." The proposed changes also remove requirements for PCIS Group 1 isolation from TS Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation." However, the MSLRM isolation function in TS Table 3.3.6.1-1 is relocated and retained for the current existing PCIS Group 2 isolation of the reactor water sample line. NRC staff concludes that this change will defeat portions of MSLRM high radiation trip function logic circuitry in the reactor protection RPS and PCIS. Will there be any impact on the operation of the RPS or PCIS with respect to other intended safety functions? If so, discuss.*

### **RESPONSE**

- 1.a. The MSLRM functions for initiating a RPS automatic reactor trip and Group 1 PCIS automatic closure of the MSIVs and MSL drain valves are not credited in the proposed CRDA analysis revision described in the Fermi 2 license amendment request (LAR). The MSLRM function for initiating automatic Group 2 PCIS isolation of the reactor water sample line is credited in the proposed CRDA analysis revision in the LAR. However, none of these MSLRM functions are credited for any other accident or transient analyses at Fermi 2.

- 1.b After implementation of the proposed TS changes, the MSLRM functions for initiating a RPS automatic reactor trip and Group 1 PCIS automatic closure of the MSIVs and MSL drain valves will be removed. However, the MSLRMs will continue to monitor the MSLs for radiation and there will be no impact on the operation of RPS or PCIS with regard to other safety functions. The MSLRM function for initiating automatic Group 2 PCIS isolation of the reactor water sample line will be retained. In addition, new MSLRM functions to automatically trip the mechanical vacuum pumps (MVPs) and gland seal exhausters (GSEs) will be added. All other RPS and PCIS function trip logic will remain unaffected by the proposed TS changes and all other intended safety functions will continue to be met as designed.

**SRXB RAI-2**

*Operating data presented in GE topical report NEDO-31400A indicates that the MSLRMs have initiated eight reactor shutdowns from 1980 through October 1992, but none of the shutdowns were the result of fuel degradation. The shutdowns were the result of instrument failures, chemistry excursions, radiation monitor maintenance errors, and other causes.*

*For Fermi 2 specifically, state how many plant shutdowns have been caused by the MSLRM trip function. For each shutdown discuss the cause for those MSLRM trip function initiations, including whether any of the shutdowns were the result of actual fuel degradation, and whether the shutdown was unnecessary.*

**RESPONSE**

Fermi 2 has not experienced any plant shutdowns caused by the MSLRM functions. Although Fermi 2 has not directly experienced any plant shutdowns, the removal of the MSLRM functions identified in the LAR is being pursued to eliminate the vulnerability to an inadvertent plant shutdown with loss of normal heat sink, such as those experienced by other plants as described in NEDO-31400A.

### **SRXB RAI-3**

*The August 24, 2017, application on page 7 of Enclosure 1 states that “Above 10% rated thermal power, control rod reactivity worth is reduced such that the effects of postulated rod drop are not sufficient to cause significant fuel damage.” In order for the NRC staff to evaluate the impact of the proposed license amendment on the CRDA analytical results, provide the following information, as it relates to the current CRDA analysis of record, and how the proposed changes would impact the degree of fuel damage:*

- c. Other than to eliminate the MSLRM trip and the related isolation functions proposed for the CRDA in the licensee's application, will there be any other changes of parameters and assumptions that are made for a CRDA analysis at Fermi 2? If so, discuss the changes and its impact on the CRDA analysis results.*
- d. In the Fermi 2 CRDA analysis which trip function of the RPS is credited to scram the reactor, and does this change as a result of eliminating the MSLRM high radiation trip function? If so, discuss the impact of the change.*
- e. Other than radiological consequences, discuss whether there is any impact from eliminating the MSLRM high radiation trip function on the degree of fuel damage during a CRDA or any other adverse impact on the core or the plant.*
- f. Has the number of fuel rods predicted to fail and melt changed for a CRDA as a result of eliminating the MSLRM high radiation trip function? If so, discuss.*

### **RESPONSE**

- 3.c. The LAR explicitly requested approval to extend the Alternate Source Term (AST) methodology to the CRDA analysis. As a result, the LAR provided a detailed description of parameters and assumptions associated with the new AST-based CRDA analysis. Other than those changes described in the LAR, no other changes to parameters and assumptions are being made for the Fermi 2 CRDA analysis.
- 3.d. The MSLRM high radiation reactor trip function was not previously credited to initiate reactor trip in the CRDA analysis. Elimination of this reactor trip has no impact on the CRDA analysis. In the event of a CRDA, the neutron monitoring system will shut down the reactor in the response to the high flux condition. Specifically, TS Table 3.3.1.1-1 Function 2.c (Average Power Range Monitors Neutron Flux – Upscale) is credited to trip the reactor during a CRDA. Therefore, the credited reactor trip is not changed.
- 3.e. The degree of damaged fuel as a result of the CRDA is determined by a bounding analysis by the fuel vendor for the particular fuel design. The bounding analysis does not credit the MSLRM high radiation trip function. Therefore, the degree of damaged fuel is not

impacted by the elimination of the trip function. There are no other adverse impacts on the core or plant.

- 3.f The number of failed fuel rods assumed is 1200 as described in the LAR. The value was selected for the AST-based CRDA analysis in the LAR based on the bounding analysis by the fuel vendor for the particular fuel design for Fermi 2. The value was not revised as a result of eliminating the MSLRM high radiation trip function.