



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

~~April~~ 5, 2016

Mr. Paul Fessler
Senior Vice President and
Chief Nuclear Officer
DTE Electric Company
Fermi 2 - 210 NOC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMIL 2 - ISSUANCE OF AMENDMENT RE: TECHNICAL SPECIFICATION
SECTION 3.5.1, "EMERGENCY CORE COOLING SYSTEM - OPERATING"
(CAC NO. MF6757)

Dear Mr. Fessler:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 203 to Facility Operating License No. NPF-43 for the Fermi 2 facility. The amendment is in response to your application dated September 24, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15268A422).

The amendment deletes the note associated with Surveillance Requirement (SR) 3.5.1.4 to reflect the Residual Heat Removal (RHR) system design and ensure the RHR system operation is consistent with TS 3.5.1 Limiting Condition for Operation requirements.

P. Fessler

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A copy of the related safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jen Rankin', with a stylized flourish at the end.

Jennivine K. Rankin, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosures:

1. Amendment No. 203 to NPF-43
2. Safety Evaluation

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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DTE ELECTRIC COMPANY

DOCKET NO. 50-341

FERMI 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 203
License No. NPF-43

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the DTE Electric Company (DTE, the licensee) dated September 24, 2015, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. NPF-43 is hereby amended to read as follows:

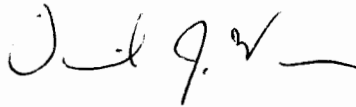
Enclosure 1

Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 203, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. DTE Electric Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "D. J. Wrona", followed by a horizontal line.

David J. Wrona, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating License
And Technical Specifications

Date of Issuance: April 5, 2016

ATTACHMENT TO LICENSE AMENDMENT NO. 203

FACILITY OPERATING LICENSE NO. NPF-43

DOCKET NO. 50-341

Replace the following pages of the Facility Operating License with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

Page 3

INSERT

Page 3

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3.5-5

INSERT

3.5-5

- (4) DTE Electric Company, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material such as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
 - (5) DTE Electric Company, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
 - (6) DTE Electric Company, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- C. This license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
- (1) Maximum Power Level

DTE Electric Company is authorized to operate the facility at reactor core power levels not in excess of 3486 megawatts thermal (100% power) in accordance with conditions specified herein and in Attachment 1 to this license. The items identified in Attachment 1 to this license shall be completed as specified. Attachment 1 is hereby incorporated into this license.
 - (2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 203, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. DTE Electric Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.
 - (3) Antitrust Conditions

DTE Electric Company shall abide by the agreements and interpretations between it and the Department of Justice relating to Article I, Paragraph 3 of the Electric Power Pool Agreement between DTE Electric Company and

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.4	Verify each ECCS injection/spray subsystem manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.5	Verify primary containment pneumatic supply pressure is ≥ 75 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.6	Verify the RHR System power operated cross tie valve is open.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.7	Verify each recirculation pump discharge valve cycles through one complete cycle of full travel or is de-energized in the closed position.	In accordance with the Surveillance Frequency Control Program

(continued)



UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 203 TO FACILITY OPERATING LICENSE NO. NPF-43

DTE ELECTRIC COMPANY

FERMI 2

DOCKET NO. 50-341

1.0 INTRODUCTION

By application dated September 24, 2015 (Agencywide Document Access and Management System (ADAMS) Accession No. ML15268A422), DTE Electric Company (DTE) (the licensee), requested changes to the technical specifications (TSs) for Fermi 2. The proposed revisions would delete the note associated with Surveillance Requirement (SR) 3.5.1.4 to reflect the Residual Heat Removal (RHR) system design and ensure the RHR system operation is consistent with the TS 3.5.1, "ECCS – Operating," Limiting Condition for Operation (LCO) requirements.

The U.S. Nuclear Regulatory Commission (NRC or the Commission) staff's original proposed significant hazards consideration determination was published in the *Federal Register* on November 24, 2015 (80 FR 73235).

2.0 REGULATORY EVALUATION

2.1 System Description

The safety function of the emergency core cooling system (ECCS) is to provide core cooling following a loss-of-coolant accident (LOCA). The ECCS consists of two high-pressure and two low-pressure systems. The high-pressure systems are the high-pressure core injection (HPCI) system and the automatic depressurization system (ADS). The low-pressure systems are the low-pressure core injection (LPCI) mode of RHR and the low-pressure core spray (LPCS) system.

Following a LOCA, the RHR system performs two functions as the low head portion of the ECCS:

- Restore and maintain the coolant inventory in the reactor vessel so that the core is adequately cooled; and

- Provide cooling for the containment so that condensation of the steam resulting from the blowdown is ensured.

The RHR system may also be used in the shutdown cooling mode to remove residual heat from the nuclear system to maintain reactor water inventory below 212 degrees Fahrenheit (°F) so that refueling and nuclear system servicing can be performed.

2.2 Proposed Changes

The proposed change will delete the following note in the Fermi 2 TS SR 3.5.1.4:

Low pressure coolant injection (LPCI) subsystems may be considered OPERABLE during alignment and operation for decay heat removal with reactor steam dome pressure less than the Residual Heat Removal (RHR) cut-in permissive pressure in MODE 3, and for 4 hours after exceeding the RHR cut-in permissive pressure in MODE 3, if capable of being manually realigned and not otherwise inoperable.

2.3 Applicable Regulatory Requirements

10 CFR Part 50, Appendix A, General Design Criteria (GDC) 34, "Residual Heat Removal," requires that a system to remove residual heat be provided with a safety function to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

10 CFR Part 50, Appendix A, GDC 35, "Emergency Core Cooling," requires that a system to provide abundant emergency core cooling be provided with a safety function to transfer heat from the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented and (2) clad metal-water reaction is limited to negligible amounts.

10 CFR Part 50, Appendix A, GDC 37, "Testing of Emergency Core Cooling System," requires that the emergency core cooling system design provide the capability for periodic pressure and functional testing. This testing shall assure (1) structural and leak-tight integrity of components, (2) operability and performance of active components, and (3) operability of the entire system under conditions as close to design as possible.

10 CFR 50.36, "Technical Specifications," provides the information that must be included in a station's TS. Per 10 CFR 50.36, TS are required to include (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. As described in 10 CFR 50.36(c)(3), "Surveillance requirements" are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

10 CFR 50.46(a)(1)(i) requires that each boiling or pressurized light-water nuclear power reactor be provided with an ECCS designed with a calculated cooling performance in accordance with an acceptable evaluation model following a postulated loss-of-coolant accident.

3.0 TECHNICAL EVALUATION

3.1 Summary of Technical Information Provided by Licensee

By application dated September 24, 2015, the licensee provided the following justification for removal of the note in SR 3.5.1.4:

NRC Information Notice (IN) 2010-11 [Potential for Steam Voiding Causing Residual Heat Removal System Inoperability, June 16, 2010, ADAMS Accession No. ML100640465] and industry operating experience indicate that during operation in Mode 3, the potential exists for the water in the RHR pump suction piping aligned for shutdown cooling to flash/boil when the subsystem is realigned to the LPCI mode. This phenomenon is due to the physical arrangement (i.e., common interface) of the shutdown cooling and LPCI suction lines for the RHR pumps. The realignment from shutdown mode to LPCI mode transfers the suction source for the RHR pump; thereby exposing the high temperature shutdown cooling water to the low pressure LPCI suction piping from the Suppression Pool. The resultant flashing/boiling of the high pressure, high temperature water when introduced to the low pressure piping could result in voiding in the suction piping, RHR pump cavitation, water hammer, and associated RHR system damage. This vulnerability is greatest during the early stages of Mode 3 operation when the shutdown cooling water temperature is highest.

The potential for flashing/boiling in the RHR suction piping and Suppression Pool suction valve thermal binding are the result of the RHR system design that supports several different operating modes using common equipment. This design feature, and the associated temperature phenomenon, prevents timely realignment of the RHR subsystem from shutdown cooling mode to LPCI mode. Therefore, the SR 3.5.1.4 note that allows an RHR subsystem to remain OPERABLE for LPCI mode when being aligned or operated in shutdown cooling mode is inappropriate and should be removed from the Fermi 2 TS. Fermi 2 will continue to declare the respective LPCI subsystem of ECCS inoperable for the subsystem operating in shutdown cooling mode and enter the appropriate Condition(s) of TS 3.5.1 in Mode 3. This operation is consistent with Fermi 2 practice in declaring the respective containment cooling modes of RHR inoperable for the RHR subsystem operating in shutdown cooling mode and entering the appropriate Condition(s) of TS Sections 3.6.2.3, "RHR Suppression Pool Cooling," and 3.6.2.4, "RHR Suppression Pool Spray," during Mode 3.

Standard Technical Specifications (STS – NUREG-1433 [General Electric Plant (BWR/4)]) recognized this boiling water reactor design configuration and the mutual exclusivity of the LPCI and shutdown cooling functions. The STS bases explains the allowance provided by the TS 3.5.1 note (Fermi 2 SR 3.5.1.4 note)

as "necessary since the RHR System may be required to operate in the shutdown cooling mode to remove decay heat and sensible heat from the reactor. At these low pressure and decay heat levels, a reduced complement of ECCS subsystems should provide the required core cooling, thereby allowing operation of RHR shutdown cooling when necessary." However, industry and site specific operating experience makes the application of the TS 3.5.1 note (Fermi 2 SR 3.5.1.4 note) inappropriate at Fermi 2.

3.2 Summary of NRC Staff Review

The NRC staff reviewed the proposed deletion of the note associated with SR 3.5.1.4 for TS 3.5.1. The staff finds that the current note could potentially allow operating conditions to exist that could adversely impact the function of the RHR system because high pressure, high temperature water when introduced to the low pressure piping could result in voiding in the suction piping, RHR pump cavitation, water hammer, and associated RHR system damage. The removal of the note still meets the provided GDCs because the note may hinder the ability of the RHR system to transfer fission product decay heat and other residual heat from the reactor core, as required by these GDCs. Removing the note from TS SR 3.5.1.4 averts potential damage to the RHR system, which performs a key safety function of preventing damage to the fuel cladding, and preventing fuel design limits and design conditions of the reactor coolant pressure boundary from being exceeded, as required by the GDCs. Therefore, the proposed changes are consistent with the GDCs. As such, the NRC staff finds that removal of the note for SR 3.5.1.4 for TS 3.5.1 is acceptable.

The licensee's application provided revised TS Bases pages to be implemented with the associated TS changes. These pages were provided for information only. Changes to the TS bases would be made by the licensee in accordance with the TS Bases Control Program.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Michigan State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes the surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (80 FR 73235, November 24, 2015). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the consideration discussed above that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) activities proposed will be conducted in compliance with the Commission's Regulations and (3) the issuance of the amendment will not be inimical to the common defense and security or the health and safety of the public. The NRC staff evaluated the licensee's proposed changes to modify TS 3.5.1 and delete the note associated with SR 3.5.1.4 and concludes that the proposed deletion of the note associated with SR 3.5.1.4 is acceptable.

Principal Contributor: M. Hardgrove, NRR/DSS

Date: April 5, 2016

P. Fessler

- 2 -

A copy of the related safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Jennivine K. Rankin, Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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***via memo **via email**

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