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

September 20, 2018

Mr. Keith J. Polson
Senior Vice President and
Chief Nuclear Officer
DTE Electric Company
Fermi 2 – 260 TAC
6400 North Dixie Highway
Newport, MI 48166

SUBJECT: FERMI 2 - ISSUANCE OF AMENDMENT RE: ELIMINATION OF MAIN STEAM LINE RADIATION MONITOR TRIP AND ISOLATION FUNCTION (CAC NO. MG0228; EPID L-2017-LLA-0274)

Dear Mr. Polson:

The U.S. Nuclear Regulatory Commission (NRC or Commission) has issued the enclosed amendment No. 212 to Renewed Facility Operating License No. NPF-43 for Fermi 2. The amendment is in response to your application dated August 24, 2017, as supplemented by letters dated October 18, 2017, February 21, and February 27, 2018.

The amendment eliminates the main steam line radiation monitor (MSLRM) functions for initiating a reactor protection system automatic reactor trip and automatic closure of the main steam isolation valves and main steam line drain valves for the associated (Group 1) primary containment isolation system (PCIS). Specifically, it removes requirements for the MSLRM trip function from Technical Specification (TS) Table 3.3.1.1-1, "Reactor Protection System Instrumentation." The amendment also removes requirements for PCIS Group 1 isolation from TS Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation," and the MSLRM isolation function is relocated and retained for the current existing PCIS Group 2 isolation of the reactor water sample line.

The amendment also adds two new TS limiting conditions for operation, 3.3.7.2 and 3.3.7.3, for the mechanical vacuum pump and gland seal exhauster trip instrumentation that will be required to actuate in response to high main steam line radiation. In addition, this amendment approves the implementation of the alternative source term for the analysis of the Fermi 2 control rod drop accident.

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,

Sujata Goetz, Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-341

Enclosures:
1. Amendment No. 212 to NPF-43
2. Safety Evaluation

cc: Listserv

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

DTE ELECTRIC COMPANY

DOCKET NO. 50-341

FERMI 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 212
Renewed 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 August 24, 2017, as supplemented by letters dated October 18, 2017, February 21, and February 27, 2018, 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 Renewed Facility Operating License No. NPF-43 is hereby amended to read as follows:

   Technical Specifications and Environmental Protection Plan

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 212, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this renewed 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 during the next refueling outage following approval.

FOR THE NUCLEAR REGULATORY COMMISSION

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

Attachment:
Changes to the Renewed Facility
Operating License NPF-43
and Technical Specifications

Date of Issuance: September 20, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 212

FERMI 2

RENEWED FACILITY OPERATING LICENSE NO. NPF-43

DOCKET NO. 50-341

Replace the following pages of the Renewed Facility Operating License No. NPF-43 and 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.

Renewed Facility Operating License No. NPF 43

REMOVE	INSERT
- 4 -	- 4 -

Technical Specifications

REMOVE	INSERT
ii	ii
3.3-3	3.3-3
3.3-9	3.3-9
3.3-50	3.3-50
3.3-55	3.3-55
3.3-56	3.3-56
- -	3.3-70a
- -	3.3-70b
- -	3.3-70c
- -	3.3-70d
- -	3.3-70e
- -	3.3-70f

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 212, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this renewed 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 Consumers Power Company as specified in a letter from The Detroit Edison Company to the Director of Regulation, dated August 13,1971, and the letter from Richard W. McLaren, Assistant Attorney General, Antitrust Division, U.S. Department of Justice, to Bertram H. Schur, Associate General Counsel, Atomic Energy Commission, dated August 16, 1971.

(4) Deleted

(5) Deleted

(6) Deleted

(7) Deleted

(8) Deleted

(9) Modifications for Fire Protection (Section 9.5.1, SSER #5 and SSER #6)*

DTE Electric Company shall implement and maintain in effect all provisions of the approved fire protection program as described in its Final Safety Analysis Report for the facility through Amendment 60 and as approved in the SER through Supplement No. 5, subject to the following provision:

(a) DTE Electric Company may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

* The parenthetical notation following the title of many license conditions denotes the section of the Safety Evaluation Report (SER) and/or its supplements wherein the license condition is discussed.

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	G.1 Be in MODE 3.	12 hours
H. Deleted		
I. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	I.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately
J. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	J.1 Initiate alternate method to detect and suppress thermal hydraulic instability oscillations.	12 hours

(continued)

Table 3.3.1.1-1 (page 2 of 3)
Reactor Protection System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2.	Average Power Range Monitors (continued)					
	c. Neutron Flux - Upscale	1	3(c)	F	SR 3.3.1.1.2 SR 3.3.1.1.3 SR 3.3.1.1.8 SR 3.3.1.1.12 SR 3.3.1.1.18	≤ 120% RTP
	d. Inop	1,2	3(c)	G	SR 3.3.1.1.12	NA
	e. 2-out-of-4 Voter	1,2	2	G	SR 3.3.1.1.2 SR 3.3.1.1.12 SR 3.3.1.1.17 SR 3.3.1.1.19	NA
	f. OPRM Upscale	≥ 25% RTP	3(c)	J	SR 3.3.1.1.2 SR 3.3.1.1.8 SR 3.3.1.1.12 SR 3.3.1.1.18 SR 3.3.1.1.20	NA
3.	Reactor Vessel Steam Dome Pressure-High	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 1113 psig
4.	Reactor Vessel Water Level-Low, Level 3	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≥ 171.9 inches
5.	Main Steam Isolation Valve-Closure	1	8	F	SR 3.3.1.1.9 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.17	≤ 12% closed
6.	Deleted					
7.	Drywell Pressure-High	1,2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.9 SR 3.3.1.1.10 SR 3.3.1.1.14 SR 3.3.1.1.15	≤ 1.88 psig

(continued)

(c) Each APRM channel provides inputs to both trip systems.

3.3 INSTRUMENTATION

3.3.6.1 Primary Containment Isolation Instrumentation

LCO 3.3.6.1 The primary containment isolation instrumentation for each Function in Table 3.3.6.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.6.1-1.

ACTIONS

----------NOTES----------
1. Penetration flow paths may be unisolated intermittently under administrative controls.
2. Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Place channel in trip.	12 hours for Functions 2.a, 2.c, 2.d, 6.b, 7.a, and 7.b AND 24 hours for Functions other than Functions 2.a, 2.c, 2.d, 6.b, 7.a, and 7.b
----------NOTE---------- With a Table 3.3.6.1-1 Function 5.c channel inoperable, isolation capability is considered maintained provided Function 5.b is OPERABLE in the affected room. ---------- B. One or more automatic Functions with isolation capability not maintained.	B.1 Restore isolation capability.	1 hour

(continued)

Table 3.3.6.1-1 (page 1 of 5)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Main Steam Line Isolation					
a. Reactor Vessel Water Level – Low Low Low, Level 1	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.7	≥ 24.8 inches
b. Main Steam Line Pressure – Low	1	2	E	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 736 psig
c. Main Steam Line Flow – High	1,2,3	2 per MSL	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.7	≤ 118.4 psid
d. Condenser Pressure – High	1, 2(a), 3(a)	2	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 7.05 psia
e. Main Steam Tunnel Temperature – High	1,2,3	2 per trip string	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 206°F
f. Deleted					
g. Turbine Building Area Temperature – High	1,2,3	4	D	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 206°F
h. Manual Initiation	1,2,3	1 per valve	G	SR 3.3.6.1.6	NA

(continued)

(a) Except when bypassed during reactor shutdown or for reactor startup under administrative control.

Table 3.3.6.1-1 (page 2 of 5)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Primary Containment Isolation					
a. Reactor Vessel Water Level – Low, Level 3	1,2,3	2	H	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 171.9 inches
b. Reactor Vessel Water Level – Low, Level 2	1,2,3	2	H	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 103.8 inches
c. Drywell Pressure – High	1,2,3	2	H	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 1.88 psig
d. Main Steam Line Radiation – High	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 3.6 x full power background
e. Manual Initiation	1,2,3	1 per valve	G	SR 3.3.6.1.6	NA
3. High Pressure Coolant Injection (HPCI) System Isolation					
a. HPCI Steam Line Flow – High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 410 inches of water with time delay ≥ 1 second, and ≤ 5 seconds
b. HPCI Steam Supply Line Pressure – Low	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≥ 90 psig
c. HPCI Turbine Exhaust Diaphragm Pressure – High	1,2,3	2	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 20 psig
d. HPCI Equipment Room Temperature – High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 162°F
e. Drywell Pressure – High	1,2,3	1	F	SR 3.3.6.1.1 SR 3.3.6.1.2 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5	≤ 1.88 psig
f. Manual Initiation	1,2,3	1 per valve	G	SR 3.3.6.1.6	NA

(continued)

3.3 INSTRUMENTATION

3.3.7.2 Mechanical Vacuum Pump (MVP) Trip Instrumentation

LCO 3.3.7.2 Four channels of Main Steam Line Radiation – High Function for the MVP trip shall be OPERABLE.

APPLICABILITY: MODES 1 and 2 with any MVP in service, any main steam line not isolated, and THERMAL POWER ≤ 10% RTP.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Restore channel to OPERABLE status. OR A.2 --------NOTE-------- Not applicable if inoperable channel is the result of a non-functional MVP breaker. ---------- Place channel in trip.	12 hours
B. MVP trip capability not maintained.	B.1 Restore trip capability.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Isolate the associated MVP(s).	12 hours
	OR		
	C.2	Remove the associated MVP breaker(s) from service.	12 hours
	OR		
	C.3	Isolate the main steam lines.	12 hours
	OR		
	C.4	Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

----------NOTE----------
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided MVP trip capability is maintained.

SURVEILLANCE		FREQUENCY
SR 3.3.7.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.2.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.2.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 3.6 x full power background.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.2.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including MVP breaker actuation.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.7.3 Gland Seal Exhauster (GSE) Trip Instrumentation

LCO 3.3.7.3 Four channels of Main Steam Line Radiation – High Function for the main turbine GSE trip shall be OPERABLE.

APPLICABILITY: MODES 1 and 2 with any GSE in service, any main steam line not isolated, and THERMAL POWER ≤ 10% RTP.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required channels inoperable.	A.1	Restore channel to OPERABLE status.	12 hours
	OR		
	A.2	--------NOTE-------- Not applicable if inoperable channel is the result of a non-functional GSE breaker. ---------- Place channel in trip.	
B. GSE trip capability not maintained.	B.1	Restore trip capability.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Isolate the associated GSE(s).	12 hours
	OR		
	C.2	Remove the associated GSE breaker(s) from service.	12 hours
	OR		
	C.3	Isolate the main steam lines.	12 hours
	OR		
	C.4	Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

----------NOTE----------
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided GSE trip capability is maintained.

SURVEILLANCE		FREQUENCY
SR 3.3.7.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.3.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.3.3	Perform CHANNEL CALIBRATION. The Allowable Value shall be ≤ 3.6 x full power background.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST including GSE breaker actuation.	In accordance with the Surveillance Frequency Control Program

UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 212

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-43

DTE ELECTRIC COMPANY

FERMI 2

DOCKET NO. 50-341

1.0 INTRODUCTION

By application dated August 24, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17237A176), as supplemented by letters dated October 18, 2017 (ADAMS Accession No. ML17298A185), February 21 (ADAMS Accession No. ML18052B214), and February 27, 2018 (ADAMS Accession No. ML18072A151), DTE Electric Company (DTE or licensee) submitted a license amendment request (LAR) to make changes to the Fermi 2 Technical Specifications (TSs).

The LAR would revise TSs to eliminate the main steam line radiation monitor (MSLRM) functions for initiating a reactor protection system (RPS) automatic reactor trip and automatic closure of the main steam isolation valves (MSIVs) and main steam line (MSL) drain valves for the associated (Group 1) primary containment isolation system (PCIS). Specifically, the proposed changes remove requirements for the MSLRM trip function from 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," and the MSLRM isolation function is relocated and retained for the current existing PCIS Group 2 isolation of the reactor water sample line. The proposed changes would add two new TS limiting conditions for operation (LCOs) 3.3.7.2 and 3.3.7.3, for the mechanical vacuum pump (MVP) and gland seal exhauster (GSE) trip instrumentation that will be required to actuate in response to high MSL radiation.

The licensee referenced the U.S. Nuclear Regulatory Commission (NRC or the Commission) approved General Electric (GE) Licensing Topical Report (LTR), NEDO-31400A, "Safety Evaluation for Eliminating the Boiling Water Reactor Main Steam Line Isolation Valve Closure Function and Scram Function of the Main Steam line Radiation Monitor," dated October 31, 1992 (ADAMS Accession No. ML18213A256), as justification for eliminating the MSLRM trip and isolation functions from initiating an automatic reactor trip and automatic closure of the MSIVs.

The licensee also requested approval to extend the application of Regulatory Guide (RG) 1.183, Revision 0, "Alternative Radiological Source Terms for Evaluating Design-Basis Accidents at Nuclear Power Reactors," alternative source term (AST) assumptions and methods to the analysis of the Fermi 2 control rod drop accident (CRDA).

The supplemental letters dated October 18, 2017, February 21, and February 27, 2018, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on January 2, 2018 (83 FR 164).

2.0 REGULATORY EVALUATION

2.1 Background

Fermi 2 is a GE 4 boiling-water reactor within a Mark I containment. The Fermi 2 Updated Final Safety Analysis Report (UFSAR), Section 6.2.1.2.1, "Primary Containment," describes the primary containment as being a pressure suppression containment design that includes a drywell that houses the reactor pressure vessel, reactor coolant recirculating loops, and other branch connections of the reactor coolant system; a pressure suppression chamber that stores a large volume of water; a vent system connecting the drywell and the pressure suppression chamber water; a vacuum relief system; and isolation valves.

Each MSL includes a MSIV inside the drywell and a MSIV outside the drywell. The main steam drain line also includes an inboard and outboard containment isolation valve. The MSL goes from the reactor building into the turbine building where most of the steam passes through the main generator turbines and exhaust into the main condenser. The MVP provides the bulk air removal from the main condenser during plant startup and discharge to the reactor building exhaust stack. Steam jet air ejectors (SJAE) remove the remaining air from the main condenser and maintain normal operation vacuum by removing condenser air in-leakage as well as the hydrogen and oxygen generated by radiolysis of water in the reactor and discharge to the offgas system for processing by means of hydrogen and oxygen recombination and filtration and effective holdup of radioactivity before release from the reactor building exhaust stack.

Fermi 2 is equipped with radiation monitors which are located near the MSLs just downstream of the outboard MSIVs. These MSLRMs are designed to detect a release of fission products due to gross fuel failure. Fermi 2 has four gamma-sensitive instrument channels that monitor gamma radiation levels in the four MSLs. These detectors are physically positioned to detect significant increases in gamma radiation levels from any MSL in operation. They allow for the earliest practical detection of a gross fuel failure. The radiation trip setpoint selected is sufficiently high enough above the rated full-power background radiation level in the vicinity of the MSLs that spurious trips are minimized at rated power while ensuring that a high radiation trip results from the fission products released in the design basis CRDA. If a high radiation level is detected, the MSLRM system transmits signals to RPS and PCIS. The RPS initiates an automatic reactor scram and the PCIS initiates an automatic closure of all MSIVs, and MSL drain valves (PCIS Group 1 isolation), and PCIS Group 2 isolation of the normally closed inboard and outboard reactor water sample line isolation valves associated with the reactor recirculation loop B to limit fuel damage and control the release of fission products.

The high radiation signal also initiates a Group 2 isolation of the reactor water sample line. The nominal trip setpoint of the reactor scram and PCIS is 3.0 times normal full power Nitrogen-16 (N-16) background. The current MSLRM alarm setpoint is approximately 2.8 times normal full power background radiation levels of N-16. These setpoints were chosen to be high enough above the normal N-16 background dose rate at the monitor locations to prevent false trips, and

yet low enough to detect gross failure in the fuel cladding to enable corrective actions prior to a release exceeding the Title 10 of the *Code of Federal Regulations* (10 CFR) Part 100 limits.

The nuclear industry experienced numerous inadvertent MSLRM initiated reactor shutdowns from 1980 through 1992. None of those reactor shutdowns were caused by fuel degradation; but were, instead, the result of instrument failures, chemistry excursions, radiation monitor maintenance errors, and other causes.

In order to reduce the potential for unnecessary reactor trips and PCIS isolations caused by spurious actuation of the MSLRM trip and isolation functions, and to increase plant operational flexibility, the Boiling Water Reactor Owners Group proposed to eliminate the RPS automatic reactor trip and MSIV closure functions initiated by the MSLRMs, and provided a supporting safety analysis in the NEDO-31400, dated July 1987. The accepted version of NEDO-31400A was issued on October 1992.

In NEDO-31400A, the role of the MSLRM in the CRDA is evaluated, confirming that removal of the MSLRM trip and isolation functions would not compromise CRDA consequences. Two release paths were considered: (1) In NUREG-0800, Standard Review Plan (SRP) section 15.4.9 condenser release (1 percent volume per day), and (2) a forced release via the offgas system. In NEDO-31400A it is demonstrated that the radiological consequences from either release path would be expected to satisfy the acceptance limits in 10 CFR Part 100.

NEDO-31400A is a safety assessment that demonstrates that the MSIV isolation and scram functions of the MSLRMs are not required to ensure compliance with the accident doses guidelines of 10 CFR Part 100. The CRDA is the only design basis accident (DBA) where it is assumed that the MSL isolation signal comes from the MSLRMs. No design-basis event, including the CRDA, credits reactor scram initiated by the MSLRMs. Therefore, in the NEDO report, the Boiling Water Reactor Owners Group concluded that the removal of the MSLRM trip and isolation functions would not compromise CRDA consequences.

2.2 Proposed TS Changes

The licensee requested the following changes to its TSs:

1. Remove the requirement for the MSLRM trip function (Function 6) from TS Table 3.3.1.1-1.

2. Remove Condition H from TS 3.3.1.1 because it is only referenced by the Function 6 item in TS Table 3.3.1.1-1, which is being removed.

3. Remove the MSLRM isolation function (Function 1.f) from TS Table 3.3.6.1-1.

4. Relocate the MSLRM isolation function for PCIS Group 2 within TS Table 3.3.6.1-1 as new Function 2.d. The only change to the function other than the relocation is to reference Condition F instead of Condition D.

5. Re-letter the Manual Initiation function in TS Table 3.3.6.1-1 from 2.d to 2.e to support the relocation stated above in number 4.

6. Revise the Completion Time (CT) of Condition A for TS 3.3.6.1 to refer to Function 2.d instead of Function 1.f to support the relocation stated above in number 4.

7. Add new TS 3.3.7.2, "Mechanical Vacuum Pump (MVP) Trip Instrumentation."

8. Add new TS 3.3.7.3, "Gland Seal Exhauster (GSE) Trip Instrumentation."

9. Update the TS Table of Contents to reflect the new TSs.

The MSLRM system high radiation alarm function in the main control room will be retained.

2.3 Regulatory Requirements and Guidance

2.3.1 *Code of Federal Regulations*

The categories of items required to be in the TSs are provided in 10 CFR 50.36(c). As required by 10 CFR 50.36(c)(2)(i), the TSs will include LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. Regulations in 10 CFR 50.36(c)(2)(i) state that when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

The regulations at 10 CFR 50.36(c)(2)(ii) state that LCOs must be established for each item meeting one of four criteria:

> *Criterion 1.* Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.
>
> *Criterion 2.* A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to fission product barrier integrity.
>
> *Criterion 3.* A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
>
> *Criterion 4.* A structure, system, or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.

The regulation at 10 CFR 50.36(c)(3) requires TSs to include items in the category of surveillance requirements (SRs), which 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 LCOs will be met. Also, 10 CFR 50.36(a)(1) states that a summary statement of the bases or reasons for such specifications, other than those covering administrative controls, shall also be included in the application, but shall not become part of the TSs.

Regulation 10 CFR 50.67(b)(2), under "Accident source term," states that:

> (i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 roentgen equivalent man (rem))[2] total effective dose equivalent (TEDE).
>
> (ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 rem) total effective dose equivalent (TEDE).
>
> (iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) total effective dose equivalent (TEDE) for the duration of the accident.

2.3.2 *General Design Criteria*

The regulations in Appendix A to 10 CFR 50, "General Design Criteria for Nuclear Power Plants" (herein after referenced to as GDC), establish the minimum requirements for the principal design criteria of water-cooled nuclear power plants. The principal design criteria establish the necessary design, fabrication, construction, testing, and performance requirements for structure, systems, and components important to safety.

The NRC staff identified the following GDCs that are applicable to the August 24, 2017, LAR:

GDC 13, "Instrumentation and control," requires that instrumentation be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety.

GDC 19, "Control room," requires that a control room be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents (LOCAs). Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident.

GDC 20, "Protection system functions," requires the protection system to be designed to sense accident conditions and to initiate the operation of systems and components important to safety.

GDC 28, "Reactivity limits," requires that reactivity control systems be designed with appropriate limits on the potential amount and rate of reactivity increase to assure that

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[2] The use of 0.25 Sv (25 rem) TEDE is not intended to imply that this value constitutes an acceptable limit for emergency doses to the public under accident conditions. Rather, this 0.25 Sv (25 rem) TEDE value has been stated in this section as a reference value, which can be used in the evaluation of proposed design basis changes with respect to potential reactor accidents of exceedingly low probability of occurrence and low risk of public exposure to radiation.

the effects of postulated reactivity accidents can neither (1) result in damage to the reactor coolant pressure boundary greater than limited local yielding nor (2) sufficiently disturb the core, its support structures, or other reactor pressure vessel internals to impair significantly the capability to cool the core.

2.3.3 *Regulatory Guides*

RG 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants," March 2007, provides guidance regarding onsite meteorological measurements program that the NRC staff considers acceptable for the collecting basic meteorological data needed to support plant licensing and operation.

RG 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants," May 2008, provides guidance on determining atmospheric relative concentration (χ/Q) values for use in assessing the potential offsite radiological consequences for a range of postulated accidental releases of radioactive material to the atmosphere for various locations around the exclusion area boundary (EAB) and low population zone (LPZ) boundaries.

RG 1.183, "Alternative Radiological Source Terms for Evaluating Design-basis Accidents at Nuclear Power Reactors," July 2000, provides the methodology for analyzing the radiological consequences of several DBAs to show compliance with 10 CFR 50.67. The RG provides guidance to licensees on acceptable application of AST submittals, including acceptable radiological analysis assumptions for use in conjunction with the accepted AST.

RG 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants," June 2003, provides guidance on determining atmospheric relative concentration (χ/Q) values in support of design basis control room radiological habitability assessments at nuclear power plants. This guide describes methods acceptable to the NRC staff for determining χ/Q values that will be used in control room radiological habitability assessments performed in support of applications for licenses and LAR.

2.3.4 *Other Guidance*

SRP Section 2.3.4, "Short-Term Diffusion Estimates for Accidental Atmospheric Releases," and SRP Section 15.0.1, "Radiological Consequence Analyses Using Alternative Source Terms," Revision 0, July 2000, provide guidance to the NRC staff for the review of AST amendment requests. In SRP Section 15.0.1, it states that the NRC reviewer should evaluate the proposed change against the guidance in RG 1.183. The dose acceptance criteria for the CRDA are a TEDE of 6.3 rem at the EAB for the maximum 2-hour period, and 6.3 rem at the outer boundary of the LPZ during the entire period of the postulated radioactive cloud passage. The NRC staff also considered relevant information in the Fermi 2 UFSAR.

NEDO-31400A provides a safety assessment for the elimination of the boiling-water reactor scram and MSIV closure function of the MSLRMs.

2.3.5 *License Amendments*

License Amendment No. 144, "Fermi 2 – Issuance of Amendment RE: Re-evaluation of Fuel Handling Accident, Selective Implementation of 10 CFR 50.67 (TAC No. MB0956)," dated September 28, 2001 (ADAMS Accession No. ML012290521), and License Amendment

No. 160, "Fermi 2 – Issuance of Amendments RE: Selective Implementation of Alternative Radiological Source Term Methodology (TAC No. MB7794)," dated September 28, 2004 (ADAMS Accession No. ML042430179), revised the Fermi 2 TSs to support selective implementation of the AST methodology for the loss-of-coolant and fuel handling accidents pursuant to 10 CFR 50.67, using the methodology described in RG 1.183 for analyzing the radiological consequences of DBAs.

3.0 TECHNICAL EVALUATION

The NEDO-31400A report is applicable to Fermi 2 and provides the technical basis for the elimination of the MSLRM system high radiation trip function for initiating an automatic reactor scram and automatic closure of the MSIVs. NEDO-31400A requires re-evaluation of the CRDA in UFSAR Section 15.4.9 with the assumption that the MSIVs remain open and consideration of two cases: (1) the original deterministic release from the main condenser at a rate of 1 percent per day and (2) forced release via the offgas system, i.e., SJAE discharge.

In the NRC safety evaluation of NEDO-31400, the NRC staff stated that participating boiling-water reactor utilities, listed in Table 1 of the topical report, may reference the NEDO-31400A in support of their license amendment application if they meet the following conditions:

1. The licensee must demonstrate that the assumptions with regard to input values (including power per assembly, atmosphere dispersion factors (x/Q) and decay times) that are made in the generic analysis bound those for the plant.

2. The licensee must provide reasonable assurance that increased levels of radioactivity in the MSLs will be controlled expeditiously to limit both occupational doses and environmental releases.

3. The MSLRM and offgas radiation monitor alarm setpoints must be set at 1.5 times the nominal background including N-16 at the monitor locations and the licensee must promptly sample the reactor coolant to determine possible contamination levels if the setpoint of either monitor is exceeded.

Subsequent to the staff's acceptance of NEDO-31400, the NRC issued updated guidance for determining the radiological consequences of a CRDA using AST and non-AST methodologies. Amendment Nos. 144 and 160 allowed Fermi 2 to selectively implemented the AST methodology for analysis of the design basis fuel handling accident and loss of coolant accident (LOCA). In the current LAR, the licensee requested approval to extend the application of the RG 1.183 AST assumptions and methods to the CRDA analysis documented in UFSAR Section 15.4.9, and provided a re-analysis of the CRDA to demonstrate compliance with 10 CFR 50.67.

For Condition 1, above, the licensee stated:

> In accordance with the approved NEDO-31400A protocol, the offsite and control room radiological consequences of a postulated CRDA have been re-analyzed. The radiological consequences of this accident are evaluated in accordance with the NRC staff assumptions and methods described in Appendix C of the RG 1.183, Revision 0, AST in order to conservatively demonstrate compliance with 10 CFR 50.67. Since Fermi 2 has only selectively implemented the AST

methodology for analysis of the design basis fuel handling accident and LOCA (References 7.14 and 7.15), this submittal also requests approval to extend the AST methodology to the analysis of the Fermi 2 CRDA.

The NRC staff's evaluation of the CRDA analysis and the licensee's response to Condition 1 is provided in Section 3.1 below.

3.1 Control Rod Drop Accident Analysis

The CRDA is the postulated event of a high worth control rod being inserted into the reactor core. The rod then becomes uncoupled from its control rod drive mechanism. The control rod mechanism is subsequently withdrawn with the control rod remaining stuck in place. At a later time, the control rod suddenly falls free and drops out of the core. This results in the rapid large reactivity increase in the core, which in turn results in a localized power excursion. Fermi 2's analysis of the CRDA, had the occurrence of fuel damage and a limited amount of melted fuel in the damaged rods.

3.1.1 Accident Source Term

The core isotopic inventory available for release into the reactor coolant system is based on a core bundle average exposure of 35 gigawatt days per metric ton of uranium for a maximum full power operation at 3,499 megawatts thermal (MWt), or 1.003 times the current licensed thermal power level of 3,486 MWt. The source term is scaled by a radial peaking factor of 1.7 and combined the release of the gap activity from the damaged fuel rods and the melted fuel. The number of failed rods during a CRDA is assumed to be 1,200 rods for bounding case of 10 x 10 GE 14 fuel, of which 10 percent of the core inventory of noble gases and iodine, and 12 percent of the core inventory of alkali metals, are released from the fuel gap. Of the 1,200 failed fuel rods, 0.77 percent is assumed to melt releasing 100 percent of the noble gases, 50 percent of the iodine, and 25 percent of the alkali metals to the reactor coolant. The gap activity and the activity from melted fuel mixes instantaneously in the reactor coolant within the reactor pressure vessel with no credit for partitioning or removal by the steam separators. The analysis assumes that the speciation of radioactive iodine released from the failed fuel is 95 percent particulate, 4.85 percent elemental, and 0.15 percent organic, and that all other non-noble gas isotopes are released in 100 percent particulate form.

Of the activity released from the reactor coolant within the pressure vessel, 100 percent of the noble gases, 10 percent of the iodine, and 1 percent of the alkali metal nuclides are assumed to reach the turbine and condensers. Of the activity that reaches the turbine and condensers, 100 percent of the noble gases, 10 percent of the iodine, and 1 percent of the alkali metal nuclides are available for release to the environment. The accident release duration is 24 hours. No credit is taken for MSIV closure, nor SJAE shutdown prior to 24 hours.

By letter dated February 21, 2018, the licensee stated in response to NRC staff's question number SRXB RAI-3, that the amount of damaged fuel as a result of the CRDA is determined by a bounding analysis for a particular fuel design by the fuel vendor, and is not impacted by this proposed LAR, and that the number of fuel rods predicted to fail and melt is not changed.

3.1.2 Control Room Habitability for the CRDA

The licensee's analysis assumes no credit for automatic or manual operation of the control room emergency filtration system. The control room ventilated volume is 252,731 cubic feet and the normal makeup flow rate is less than 4,000 cubic feet per minute.

3.1.3 Transport

The licensee analyzed the following release pathways for the AST CRDA:

- Release from the main condenser at a rate of 1 percent per day, and
- Forced release via the offgas system.

3.1.3.1 Main Condenser

The main condenser is assumed to leak activity into the turbine building at a rate of 1 percent per day. Radioactive decay during holdup in the condenser is credited. This activity is then released, unfiltered, to the environment by way of the turbine building ventilation stack as a zero-velocity vent release, taking no credit for holdup or dilution in the turbine building. The licensee's dose results for the main condenser pathway demonstrated that the calculated radiological consequences are within the regulatory limits stated in 10 CFR 50.67.

3.1.3.2 Forced Release Pathways

The licensee evaluated the following potential forced release pathways via the SJAEs, MVPs, and the GSEs.

Steam Jet Air Ejectors (SJAE)

The main condenser evacuation system consists of four, two-stage SJAE units, complete with intercondensers for normal plant operation and MVPs for use during startup. Typically, two of the four SJAE units are required for normal operation. The SJAEs are placed into operation once 300 pounds per square inch gauge (psig) steam is available. The SJAEs remove the gases from the main condenser after vacuum has been established in the main condenser by the MVPs. Main steam is supplied as the driving medium to the two-stage SJAEs. The first stages take suction from the main condenser and exhaust the gas vapor mixture to the intercondensers. The second stages exhaust the suction gas vapor mixture from the intercondensers to the offgas system. The offgas system processes the exhaust of the SJAE first to recombine hydrogen and then to pass it through a series of sand filters which remove particulates and a series of charcoal adsorber beds that retain iodine and holdup the noble gases to allow the natural decay process to significantly reduce activities prior to release to the environment via the reactor building exhaust stack. The charcoal bed hold up time for krypton is 8 hours and xenon is 4.66 days. The analysis of a release via the offgas system assumes that the MSIVs do not close and that steam flow continues for approximately 24 hours before this path is isolated. The licensee's dose results for the SJAE pathway demonstrated that the calculated radiological consequences are within the regulatory limits stated in 10 CFR 50.67.

Mechanical Vacuum Pump (MVP)

There are two MVPs which are used during startup to establish a vacuum in the condenser. The MVPs may also be used to maintain condenser vacuum following a plant shutdown/scram.

The MVPs are used at low reactor powers when nuclear steam flow is insufficient to operate the SJAEs. Fermi 2 plant procedures prohibit operation of the MVPs above 5 percent reactor power. The MVPs take suction from a manifold connected to the main condenser and discharge the non-condensable gases to the 2-minute delay pipe which provides a volume and holdup period for short-lived radionuclides prior to discharging to the environment via the reactor building exhaust stack. The MVPs automatically trip, and the line valves automatically close, on detection of high radiation in the 2-minute delay pipe. The MVPs, offgas 2-minute delay pipe radiation monitors, isolation valves, and associated trip logic are non-safety related, non-seismic components. Therefore, the licensee proposed to upgrade the existing MVP trips so that they utilize the safety-related MSLRM signals instead of the nonsafety-related 2-minute delay pipe signals. The use of the safety-related MSLRMs increases the redundancy and improves the reliability of the initiating trip logic up to the interface with the MVP control circuits. The use of the safety-related equipment, new LCO 3.3.7.3, is consistent with RG 1.183, Regulatory Position 5.1.2, which states that "Credit may be taken for accident mitigation features that are classified as safety-related, are required to be operable by technical specifications, are powered by emergency power sources, and are either automatically actuated or, in limited cases, have actuation requirements explicitly addressed in emergency operating procedures."

Gland Seal Exhauster (GSE)

The GSEs draw a steam/air mixture from the turbine glands into the gland condenser where the steam is condensed. Air and other non-condensable gases are then passed through the exhausters and into the offgas system upstream of the 2-minute delay pipe. After passing through the 2-minute delay pipe, the gland seal exhaust is discharged to the environment from the reactor building stack. Normally, one GSE is in operation with the other GSE in auto-standby. During normal operation, the gland sealing steam flow to the gland seal condensers is estimated to be approximately 15,000 pounds mass per hour (lbm/hr), or approximately 0.1 percent of total steam production. The steam flow required for turbine gland sealing is relatively insensitive to reactor power, such that at low power, the relative fraction of steam directed toward the GSEs is significantly larger than during high power operations. Thus, under the low power conditions for which the most limiting consequences of a postulated CRDA are credible, the fraction of source term released directly to the environment via gland sealing steam has the potential to be large relative to that delivered to the main condenser. Therefore, the licensee proposed to add safety-related instrumentation, new TS 3.3.7.3, that will trip the GSEs on detection of MSLRM high radiation in a manner similar to that of the MVPs described above in order to maintain radiological doses below the acceptance limits of RG 1.183.

The new GSE trip will be initiated on the MSL radiation – high function at the same nominal trip setpoint that currently initiates the RPS reactor scram and MSIV/MSL drain valve isolations. The proposed LCO for the GSEs (TS 3.3.7.3) would require all four channels of MSL radiation – high function to be operable in MODES 1 and 2, with any GSE in service, any MSL not isolated, and reactor core thermal power less than or equal to 10 percent rated thermal power. Above 10 percent rated thermal power, control rod reactivity worth is low enough that a postulated rod drop will not cause gross fuel damage. The licensee proposed the new GSE trips be configured with an automatic bypass. This bypass will be accomplished using the same steam and feedwater flow signals that are used to actuate the automatic bypass of the rod worth minimizer rod block function above the low power setpoint. Conversely, the GSE trip would be automatically enabled in response to reducing power below either of the rod worth minimizer low power setpoint inputs. In MODES 3, 4, and 5, the consequences of a CRDA are not expected to result in any fuel damage or fission product release. The licensee indicated that the modification involved will ensure proper electrical isolation of safety-related and non-safety

related circuits. This new TS LCO meets 10 CFR 50.36, Criterion 3, for inclusion in the Fermi 2 TS and is consistent with the other requirements of Section 50.36. The use of the safety-related equipment is consistent with RG 1.183 regulatory position 5.1.2.

The NRC staff finds the upgrade of the MVP and GSE trips to safety-related instrumentation to be acceptable as evaluated from a dose consequence perspective. Because the automatic trip of the MVPs and GSEs occurs in less than one second, based on the location of the MSLRM and the typical timing associated with the trip circuitry, the MVPs and GSEs will isolate prior to the occurrence of release. The NRC staff has determined that there is reasonable assurance that the MVP and GSE pathways maintain compliance with the regulatory limits stated in regulation 10 CFR 50.67.

3.1.4 Radiological Consequence Conclusion

The NRC staff finds that the licensee used analysis assumptions and inputs consistent with the guidance of RG 1.183. The licensee's calculated dose results are given in Table 1 below, and the assumptions found acceptable to the NRC staff are presented in Table 2. The NRC staff performed independent confirmatory dose evaluations as needed to ensure a complete understanding of the licensee's methods. The NRC staff finds, with reasonable assurance that the licensee's estimates of the EAB, LPZ, and control room doses for the CRDA will continue to comply with 10 CFR 50.67, and the acceptance criteria stated in RG 1.183 and SRP 15.0.1 and are, therefore, acceptable. The NRC staff finds, with reasonable assurance, that the licensee's change to the TSs are acceptable with regard to the radiological consequences of a CRDA.

The NRC staff reviewed the LAR as discussed above and determined that Fermi 2 is listed in Table 1 of NEDO-31400A and, therefore, meets Condition 1 in NEDO-31400A. In addition, based upon the proposed implementation of the revised procedures described in the licensee's submittal, the NRC staff finds that Conditions 2 and 3 in NEDO-31400A are satisfied for Fermi 2.

Table 1
Fermi 2 Radiological Consequence Expressed as Total Effective Dose Equivalent (rem)

	Exclusion Area Boundary	**Low Population Zone**	**Control Room**
CRDA - condenser	<0.030	<0.015	<0.250
CRDA – SJAE	<2.770	<0.650	<2.800
Dose Criteria per RG 1.183 and SRP 15.0.1	6.3	6.3	
Regulatory Limit in 10 CFR 50.67	25	25	5

Table 2
Fermi 2 AST Data and Assumptions for the CRDA

Core Thermal Power Level	3,499 Megawatts thermal
Radial Peaking Factor	1.7
Number of fuel rods damaged in full power CRDA	1200
Fraction of fission product inventory in gap	
Noble gases	10%
Iodines	10%
Alkali Metals (Cs and Rb)	12%
Fraction of damaged rods experiencing fuel melt	0.77%
Fraction of activity in melted regions released to reactor coolant system	
Noble gases	100%
Iodines	50%
Alkali Metals	25%
Fraction of activity release in reactor coolant system reaching condenser	
Noble gases	100%
Iodines	10%
Alkali Metals	1%
Fraction of activity from condenser for release to environment	
Noble gases	100%
Iodines	10%
Alkali	1%
Release rate from condenser to turbine building	1% per day for 24 hours
Charcoal bed holdup based on 3x normal offgas flow (120 standard cubic feet per minute) consistent with normal startup conditions	
Krypton	8 hours
Xenon	4.66 days
Iodine and Particulates	Infinite
Control room isolation and emergency ventilation initiation	Not credited
Main control room ventilated volume	252,731 cubic feet
Main control room shine volume	56,960 cubic feet
Main control room normal makeup flow rate	Less than 4000 cubic feet per minute

Atmospheric Dispersion	
Exclusion area boundary	
0-2 hours	2.09E-4 seconds per cubic meters (s/m^3)
Low population zone	
0-2 hours	4.86E-5 s/m^3
2-8 hours	2.17E-5 s/m^3
8-24 hours	1.45E-5 s/m^3
24-96 hours	6.02E-6 s/m^3
96-720 hours	1.71E-6 s/m^3
Main control room for steam jet air ejector	
0-2 hours	7.33E-3 s/m^3
2-8 hours	5.59E-3 s/m^3
8-24 hours	2.35E-3 s/m^3
24-96 hours	1.66E-3 s/m^3
96-720 hours	1.26E-3 s/m^3
Main control room for main condenser	
0-2 hours	1.17E-3 s/m^3
2-8 hours	9.09E-4 s/m^3
8-24 hours	3.41E-4 s/m^3
24-96 hours	2.29E-4 s/m^3
96-720 hours	1.73E-4 s/m^3

3.2 Atmospheric Dispersion Estimates

As discussed above, the licensee's LAR involves re-evaluation of the CRDA, which includes dose consequences for offsite receptors (i.e., at the EAB and at the outer boundary of the LPZ) and for the control room. The LAR identifies two release points for the CRDA: (1) main condenser leakage via the turbine building ventilation stack, and (2) SJAE discharge to the reactor building exhaust stack. The licensee uses current licensing basis χ/Q values for the EAB and LPZ receptors and developed a new set of χ/Q values for the control room receptor in the calculations made for the radiological consequence assessments. The NRC staff reviewed the licensee's new atmospheric dispersion analyses as described below.

3.2.1 Meteorological Data

The licensee provided supplemental information on October 18, 2017 (ADAMS Accession No. ML17298A185), regarding the atmospheric dispersion analysis described in the LAR. Hourly onsite meteorological data from January 1, 1995, through December 31, 1999, was provided. The meteorological data was formatted for the ARCON96 atmospheric dispersion code (NUREG/CR-6331, Revision 1, "Atmospheric Relative Concentrations in Building Wakes" (ADAMS Accession No. ML17213A187)) in order to calculate updated χ/Q values for the control room. This format contained hourly data on wind speed, wind direction, and atmospheric stability class taken from the 10 meter (m) and 60 m levels of the onsite meteorological tower.

The staff previously completed a detailed review related to the acceptability and representativeness of the hourly meteorological data for the Fermi 2 implementation of the AST methodology for the fuel handling accident in license amendment No. 144. Based on this

review, the staff considers the January 1, 1995, through December 31, 1999, hourly onsite meteorological dataset suitable for use in making calculations for the atmospheric dispersion analyses used to support this LAR.

3.2.2 Onsite Control Room Atmospheric Dispersion Estimates

The licensee used the computer code ARCON96 to estimate χ/Q values for the control room for potential accidental releases of radioactive material. RG 1.194 endorses the ARCON96 model for determining χ/Q values to be used in the design basis evaluations of control room radiological habitability.

The ARCON96 code estimates χ/Q values for various time-averaged periods ranging from 2 hours to 30 days. The meteorological input to ARCON96 consists of hourly values of wind speed, wind direction, and atmospheric stability class. The χ/Q values calculated through ARCON96 are based on the theoretical assumption that material released to the atmosphere will be normally distributed (Gaussian) about the plume centerline. A straight-line trajectory is assumed between the release points and receptors. The diffusion coefficients account for enhanced dispersion under low wind speed conditions and in building wakes.

The hourly meteorological data are used to calculate hourly relative concentrations. The hourly relative concentrations are then combined to estimate concentrations ranging in duration from 2 hours to 30 days. Cumulative frequency distributions, prepared from the average relative concentrations and the relative concentrations that are exceeded no more than 5 percent of the time for each averaging period, are determined.

The dispersion coefficients used in ARCON96 have three components. The first component is the diffusion coefficient. The other two components are corrections to account for enhanced dispersion under low wind speed conditions and in building wakes. These components are based on analysis of diffusion data collected in various building wake diffusion experiments under a wide range of meteorological conditions. Because the dispersion occurs at short distance within the plant's building complex, the ARCON96 dispersion parameters are not affected by nearby topographic features such as bodies of water. Therefore, the staff finds the licensee's use of the ARCON96 dispersion parameter assumptions acceptable.

Enclosure 1 of the LAR includes Table 1, "Parameters and Assumptions Used in Analysis of Radiological Consequences of the Control Rod Drop Accident," which provided the atmospheric dispersion estimates used in this analysis. The October 18, 2017, supplement to the LAR, included the onsite hourly meteorological data from 1995 through 1999. Table D1 and Table D2 of the supplement included values of distance, direction, release heights, and intake heights to be used as inputs to ARCON96. The area of the Reactor building, 2,300 m^2, was listed in Chapter 2 of the Fermi 2 UFSAR, while the area of the Turbine building, 5,100 m^2, was listed in the ARCON96 output files provided in the October 18, 2017, supplement to the LAR.

Two receptor (i.e., air intake) points, the North Main Control Room Intake, and the South Main Control Room Intake, were modeled for the following two release points:

- Reactor Building Exhaust stack
- Turbine Building Ventilation stack

The staff confirmed the licensee's atmospheric dispersion estimates by running the ARCON96 computer model and obtaining similar results. Both the staff and licensee used a ground-level

release assumption for each of the release-receptor combinations as well as the previously discussed source-receptor distances, directions, heights, and area values. Based on the results of its confirmatory analysis, the staff finds the licensee's CR χ/Q values acceptable for use in the radiological consequence assessments.

3.2.3 Offsite EAB and LPZ Atmospheric Dispersion Estimates

The licensee used current licensing basis EAB and LPZ χ/Q values for radiological consequence assessments. The values are listed in Enclosure 1, Table 1 of the LAR. These values match those listed in Chapter 2, Table 2.3-27, of Revision 18 to the Fermi 2 UFSAR.

Section 5.3 of RG 1.183 states that χ/Q values for the EAB and LPZ approved by the staff during initial facility licensing (or in subsequent licensing proceedings) may be used in performing the AST radiological analyses. Consequently, the NRC staff concludes that the current licensing basis EAB and LPZ χ/Q values are acceptable for use by the licensee in making the offsite radiological consequences assessments associated with this LAR.

3.2.4 Conclusion

The NRC staff reviewed the guidance, assumptions, and methodology used by the licensee to assess the χ/Q values associated with postulated releases from the potential release points. The staff found that the licensee used methods consistent with RG identified in Section 2.0 of this safety evaluation. The licensee used onsite meteorological data that complied with the guidance of RG 1.23. The inputs and assumptions used to calculate the control room χ/Q values were also consistent with the guidance of RG 1.194. The licensee used current licensing basis EAB and LPZ χ/Q values for this analysis. Therefore, on the basis of this review of the atmospheric dispersion analysis, the NRC staff finds the licensee's proposed χ/Q values acceptable for use in calculating the radiological consequences assessments associated with this LAR.

3.3 Evaluation of Removing of MSLRM Trip Function Requirements

As discussed in Section 2.1 of this safety evaluation, MSLRMs were originally designed to provide an early indication of gross fuel failure. Upon receipt of the high radiation trip signals, the RPS initiates a reactor scram and PCIS isolations. Currently, the trips and isolation signals are generated on received inputs of two-out-of-four MSL radiation high signals for Fermi 2. These signals are currently used for the following functions:

- automatic closure of MSIVs, MSL drain valves, and the reactor water sample line isolation valves; and
- trip and isolation of the MVP.

As concluded in the NRC staff's evaluation for NEDO-31400, removal of the MSLRM trips that automatically shut down the reactor and close the MSIVs is acceptable provided the three conditions listed in Section 3.0 of this safety evaluation above are met. Therefore, the licensee proposed to delete Function 6, "Main Steam Line Isolation Radiation-High," in the Fermi 2 TS Table 3.3.1.1-1, "Reactor Protection System Instrumentation." Condition H in TS 3.3.1.1 is referenced by Function 6, which is proposed to be deleted; therefore, the licensee also proposed to delete Condition H from TS 3.3.1.1.

The NRC staff reviewed the information in the LAR and evaluated the proposed change associated with the licensee-specific proposal against the conditions described in NEDO-31400A. The results of this evaluation are described below.

Evaluation of Licensee's Response to Condition 1

The NRC staff's evaluation of the licensee's compliance with Condition 1 is provided in Section 3.1 of this safety evaluation.

Evaluation of Licensee's Response to Condition 2

Condition 2 of the NEDO-31400A report states that the licensee must provide reasonable assurance that increased levels of radioactivity in the MSLs will be controlled expeditiously to limit both occupational doses and environmental releases.

The licensee stated that it plans to follow the recommendations in the referenced NEDO-31400A report and the staff's safety evaluation included within the report. In the LAR, the licensee also stated that while the trip function for the reactor trip and PCIS isolation function is being removed: (1) the trip function requirements for the MVP are being maintained in the TSs and (2) the MSLRM system high radiation alarm function is being maintained in the main control room with regard to the operating procedure. In addition, the licensee responded to this condition by stating:

> Operating procedures will be reviewed and revised as necessary to ensure operator actions limit occupational doses and environmental releases upon evidence of increased levels of radioactivity in the MSLs. These changes will be completed prior to implementation of the proposed TS changes once approved by the NRC.

Based upon the licensee's response to the condition, the NRC staff finds that Condition 2 in NEDO-31400A is satisfied for Fermi 2.

Evaluation of Licensee's Response to Condition 3

Condition 3 of the NEDO-31400A report states that the MSLRM and offgas radiation monitor alarm setpoints must be set at 1.5 times the nominal background including N-16 at the monitor locations, and the licensee must promptly sample the reactor coolant to determine possible contamination levels if the setpoint of either monitor is exceeded.

The NRC staff reviewed Section 11.4.3.8.2.13 of the Fermi 2 UFSAR, "Two Minute Holdup Pipe Exhaust Radiation Monitor System," to verify that the radiation monitors for this system monitors the activity of the gases exhausted from the MVPs after the discharge from the 2-minute delay pipe. Under the conditions of the proposed change, both the existing MVP trip and new GSE trip are designed to trip in response to the safety-related MSLRM signals.

The licensee proposed to retain the MSLRM high radiation alarm function in the main control room. In compliance with NEDO-31400A guidelines, the licensee also proposed that the Fermi 2 MSLRM and offgas 2-minute delay pipe radiation monitor alarm setpoints would be lowered from 2.8 times background to 1.5 times of the full power N-16 background dose rate at the monitor locations, accounting for the effects of the licensee-specific hydrogen water

chemistry hydrogen injection rates. Thus, the Fermi 2 MSLRM alarm setpoint will remain consistent with Condition 3 in NEDO-31400A.

The normal full power N-16 background radiation is determined by averaging the detector outputs over a duration specified in station procedures. Fermi 2 TS Section 3.7.5, "Main Condenser Offgas," requires the release rate of activities from the main condenser be verified within limits within 4 hours following a 50 percent increase (1.5 times) in activity. Therefore, the licensee will sample the location to verify the release rate of activities from the main condenser, which is consistent with the Condition 3 of NEDO-31400A.

Based on the evaluation above, the NRC staff finds that the removal of MSLRM trip function and the surveillance from TS Table 3.3.1.1-1 will be performed in a manner that satisfies Condition 3 of NEDO-31400A. The staff also finds that elimination of Condition H is acceptable because the MSLRM trip function will no longer exist, thus making the reference to Condition H no longer necessary.

3.4 Evaluation of Proposed Elimination of MSLRM Functions for Initiation of Primary Containment Isolation System Group 1 Isolations

The MSLRM system currently detects release of fission products from a gross fuel failure, and initiates appropriate actions to limit fuel damage and control fission products. Four detectors monitor the gross gamma radiation from the MSL. On detection of high MSL radiation level, the MSLRM will generate trip signals to initiate a reactor scram and PCIS isolations. The PCIS will isolate all MSIVs and associated MSL drain line isolation valves (Group 1), and reactor water sample line isolation valves (Group 2).

The licensee has proposed the elimination of the MSLRM system high radiation automatic closure function for the MSL drain valves because the flow ultimately discharges into the main condenser, just as the flow from the MSIVs. Therefore, any radioactive material passing through the MSL drain valves to the main condenser and through the offgas treatment system is treated identically to any radioactive material that would pass through the MSIVs. The analysis in NED0-31400A evaluated removing the MSLRM system high radiation trip function for closing the MSIVs. However, this same analysis would apply for closure of the MSL drain valves. Release paths via the condenser and the offgas system are considered in NEDO-31400A and in the licensee's reanalysis of the CRDA radiological consequences. The NRC staff's evaluation of the CRDA reanalysis is provided in Section 3.1 of this safety evaluation. As concluded in the safety evaluation, Section 3.1.4, the licensee's CRDA assumptions and calculated doses are acceptable. Therefore, the staff finds that the elimination of the MSLRM system high radiation automatic closure function for the MSL drain valves to be acceptable.

The licensee noted that elimination of automatic closure of the inboard and outboard reactor water sample line isolation valves associated with the reactor recirculation loop B was not specifically discussed in NEDO-31400A. The licensee proposed to retain the isolation function currently shown in TS Table 3.3.6.1-1 (Function 1.f), but to relocate this function from "1. Main Steam Line Isolation" to "2. Primary Containment Isolation" (new Function 2.d). The existing Function 2.d will be renumbered to 2.e. The Function 1.f is currently used for "Main Steam Isolation"; however, as discussed above, it will no longer be used to isolate the MSLs and associated drain valves, but it will be retained to isolate the reactor water sample line valves only.

The relocation does not change the function's entries under the headings (i.e., "Applicable Modes or Other Specified Conditions," "Required Channels per Trip System," "Surveillance Requirements," or "Allowable Value") in Table 3.3.6.1-1; therefore, no change is being proposed to eliminate this Group 2 PCIS isolation from the Fermi 2 TS by this LAR, and (2) since the new Function 2.d will not isolate the MSL, the required action associated with Condition D is no longer applicable. Therefore, the "Condition Referenced from Required Action C.1" will be revised from Condition D to Condition F. Condition F has a required action to isolate the affected penetration flow with the CT of 1 hour. If the required action in Condition F is not completed within the CT of 1 hour, Condition H requires transition to MODE 3 (in 12 hours) and MODE 4 (in 36 hours).

These required Mode changes are the same as currently required by Condition D, if the Condition D is not completed within its 12 hour CT. Thus, the Condition F, rather than Condition D, is more appropriate for the new Function 2.d and the CT is more restrictive than the current CT.

In the LAR, the licensee stated that the requirements for the Fermi 2 MSLRM system high radiation alarm function will be retained in the Fermi 2 Technical Requirements Manual, along with the appropriate supporting Bases. By letter dated February 21, 2018, in response to SRXB RAI-1, the licensee stated that all other PCIS trip logic will remain unaffected by the change and will function as designed to perform their intended safety functions. The NRC staff has determined that GDC 13 and GDC 20 functions will continue to be met because there are no impacts on the operation of the RPS or PCIS with respect to other intended safety functions.

Based on the evaluation above, the NRC staff finds that the proposal to relocate the MSLRM high radiation initiation signal from Function 1.f to Function 2.d (to isolate the reactor water sample line isolation valves) is acceptable.

3.5 Evaluation of the Proposed Addition of Two New TSs 3.3.7.2 and 3.3.7.3

The licensee proposed to add two new TSs: (1) TS 3.3.7.2, "Mechanical Vacuum Pump (MVP) Trip Instrumentation," and (2) TS 3.3.7.3, "Gland Seal Exhauster (GSE) Trip Instrumentation." Based on Criterion 3 of 10 CFR 50.36(c)(2)(ii), the licensee proposed to create new LCOs 3.3.7.2 and 3.3.7.3. The licensee stated in the LAR that "The results of the re-analysis of the CRDA established that these functions are needed to ensure that the onsite and offsite radiological consequences of a postulated CRDA remain with the regulatory acceptance criteria. As such, these trips satisfy the 10 CFR 50.36(c)(2)(ii) Criterion 3 requirements for inclusion in the plant TS." The NRC staff reviewed the conditions and requirements of these new TSs as described below.

Four channels of MSL Radiation – High Function for the MVP trip (LCO 3.3.7.2) and the GSE trip (LCO 3.3.7.3) are required to be operable in MODES 1 and 2 when any MVP is in service, any MSL is not isolated, and thermal power is less than or equal to (≤) 10 percent of rated thermal power; and in Modes 1 and 2 when any GSE is in service, any MSL is not isolated, and thermal power is ≤ 10 percent of rated thermal power. As noted by the licensee, this corresponds to the applicability of TS 3.3.2.1 LCO for the Control Rod - Rod Worth Minimizer. In the LAR, the licensee stated that above 10 percent of rated thermal power, control rod reactivity worth is reduced such that the effect of a rod drop is not sufficient to cause significant fuel damage (Figure 3-9 in NEDO-10527, "Rod Drop Accident Analysis for Large Boiling Water Reactors," GE, dated March 1972 (ADAMS Accession No. ML010870249)). This trip will be

automatically bypassed above 10 percent of rated thermal power, as determined by the same feedwater flow and steam flow signals used to bypass the control rod blocks.

The trip of the MVPs and GSEs below 10 percent of rated thermal power is necessary to mitigate the consequences of a postulated CRDA. Above 10 percent of rated thermal power, the rod worths are reduced such that a postulated CRDA would not cause significant fuel damage. As described in the licensee's TS Bases, during MODES 3 and 4, all control rods are required to be inserted into the core; therefore, a CRDA cannot occur. In MODE 5, since only a single control rod can be withdrawn from a core cell containing fuel assemblies, adequate shutdown margin ensures that the consequences of a CRDA are acceptable, since the reactor will be subcritical. Therefore, the NRC staff finds that the Applicability for new proposed TSs 3.3.7.2 and 3.3.7.3, is acceptable.

The TS Actions are modified by a note indicating that a separate condition entry is allowed for each channel. Since the required actions for inoperable instrumentation channels specify the appropriate remedial actions for each channel, separate condition entry is appropriate.

The TS Actions associated with the new LCOs specify that if one or more required channels is inoperable, that the channel be restored to operable status or placed in trip within 12 hours. If trip capability is not maintained, then trip capability must be restored within 1 hour. If one of these Conditions is not met, the TS Actions require that the associated MVP or GSE be isolated, or the associated breaker be removed from service, or the MSLs be isolated, or that the unit be placed in MODE 3 (Hot Shutdown) within 12 hours. The staff determined that the allowed outage time of 12 hours for the condition of one or more channels inoperable is a reasonable period of time for any necessary testing, troubleshooting or repairs, provided trip capability is maintained. If one or more channels is inoperable, the reliability and redundancy of the system is reduced; and the time in this configuration should be appropriately limited. If trip capability is not maintained, it is to be restored within 1 hour. Lastly, if these TS Actions are not satisfied, the TS Actions provide a 12 hour period to either isolate the MVP or GSE, remove the breaker from service, isolate the MSL, or exit the Mode of applicability of the LCO. The staff determined that this 12 hour time period is sufficient to plan and conduct an orderly plant shutdown.

Four SRs and an allowable value for the high MSL radiation MVP and GSE trips are proposed along with LCOs 3.3.7.2 and 3.3.7.3. The SRs are modified by a note that states that when a channel is placed in an inoperable status solely for surveillance testing, entry into the associated Conditions and Required Actions may be delayed for 6 hours provided trip capability is maintained. This note is consistent with the notes contained in the TS for similar testing, e.g., in TS 3.3.1.1, RPS Instrumentation.

The proposed SRs include the performance of a Channel Check, Channel Functional Test, Channel Calibration (including the proposed Allowable Value of $\leq$ 3.6 x full power background), and Logic System Functional Test. The proposed Frequency would be in accordance with the Surveillance Frequency Control Program. The Allowable Value is consistent with the current value reflected in TS 3.3.1.1 for the existing Main Steam Line Radiation – High trip. The NRC staff reviewed the proposed set of SRs and determined that these requirements are appropriate to ensure a gross failure of a channel has not occurred, to ensure the channel will perform its intended function, to perform a complete check of the instrument loop and sensor, and to demonstrate the operability of the required trip logic for a given channel.

The regulation at 10 CFR 50.36(c)(2)(ii), Criterion 3, requires that a TS LCO be established for a system, structure, or component that is part of the primary success path, and which functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. Because the reconstituted CRDA dose analysis establishes that these trips are required for mitigating the radiological consequences of this postulated accident, the establishment of new TSs for the MVP trip instrumentation and the GSE trip instrumentation are consistent with the regulations.

The regulation at 10 CFR 50.36(c)(2) specifies that the TSs will contain LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. The NRC staff concluded that the new LCOs specify the minimum performance levels of equipment needed to ensure safe operation and provide the appropriate remedial actions for when the LCOs are not met.

The regulation at 10 CFR 50.36(c)(3) requires TSs to include items in the category of SRs, which 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 LCOs will be met. The NRC staff determined that the proposed new set of SRs ensures proper functioning of the instrumentation and, thus, satisfies the requirements of 10 CFR 50.36(c)(3).

3.6 Administrative Changes to TSs

The licensee proposed changes to its TSs to reflect the relocation of the MSLRM isolation function for PCIS Group 2 within TS Table 3.3.6.1-1 as new Function 2.d. As a result of the relocation, the licensee proposed to re-letter the manual initiation function in TS Table 3.3.6.1-1 from 2.d to 2.e, and to revise the CT of Condition A for TS 3.3.6.1 to refer to Function 2.d instead of Function 1.f.

Additionally, the licensee proposed to revise the TS Table of Contents to reflect the addition of new TSs 3.3.7.2 and 3.3.7.3.

The NRC staff reviewed the proposed changes described above and determined that they are administrative in nature and do not affect the analyses evaluated above in this safety evaluation. Therefore, the NRC staff finds these administrative changes to be acceptable.

3.7 Technical Conclusion

The NRC staff reviewed the LAR and determined that Fermi 2 is listed in Table 1 of the topical report and meets the requirements of Condition 1 of the NRC's generic safety evaluation for NEDO-31400A. Based upon implementation of the revised procedures described in the licensee's submittal, the NRC staff finds that the requirements of Conditions 2 and 3 of the NRC's generic safety evaluation for NEDO-31400A are satisfied for Fermi 2.

Based on its evaluation, the NRC staff finds that the proposed revisions to the Fermi 2 TSs, described within the licensee's LAR, to enable elimination of the RPS automatic reactor scram and the associated (Group 1) PCIS isolations (including elimination of the automatic closure of the MSIVs on high MSL radiation), and the automatic isolation of the MSL drain valves are acceptable because the methodology, analysis, and assumptions used in the LAR and its enclosures are consistent with the regulatory requirements and conditions identified in

Section 2.0 of this safety evaluation. The proposed changes do not exceed or alter a design basis or a safety limit for a parameter to be described or established in Fermi 2 UFSAR.

The proposed two new TSs for the MVP and GSE trip instrumentation appropriately reflect the assumptions in the revised CRDA analysis. The staff evaluated the LCOs, Required Actions, CTs, and SRs and determined that the new requirements are consistent with 10 CFR 50.36.

Therefore, Fermi 2 will continue to comply with all applicable NRC regulatory requirements.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Michigan State official was notified of the proposed issuance of the amendment July 25, 2018. 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 SRs. 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 (83 FR 164) and there has been no public comment on such finding. 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 considerations 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) there is reasonable assurance that such activities 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 to the health and safety of the public.

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SUBJECT: FERMI 2 - ISSUANCE OF AMENDMENT RE: ELIMINATION OF MAIN STEAM LINE RADIATION MONITOR TRIP AND ISOLATION FUNCTION (CAC NO. MG0228; EPID L-2017-LLA-0274) DATED SEPTEMBER 20, 2018

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