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

September 17, 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: REVISION TO TECHNICAL SPECIFICATIONS TO ADOPT TECHNICAL SPECIFICATIONS TASK FORCE (TSTF) TRAVELER TSTF-542, REVISION 2, "REACTOR PRESSURE VESSEL WATER INVENTORY CONTROL" (CAC NO. MG0208; EPID L-2017-LLA-0282)

Dear Mr. Polson:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed amendment No. 211 to Renewed Facility Operating License No. NPF-43 for Fermi 2. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 31, 2017, as supplemented by letters dated April 4, May 17, June 27, and August 7, 2018.

This amendment replaces existing TSs requirements related to "operations with a potential for draining the reactor vessel" with new requirements on reactor pressure vessel water inventory control to protect Safety Limit 2.1.1.3, which requires the reactor vessel water level to be greater than the top of active irradiated fuel.

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. 211 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. 211
Renewed License No. NPF-43

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by DTE Electric Company (DTE, the licensee), dated August 31, 2017, as supplemented by letters dated April 4, May 17, June 27, and August 7, 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:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 211, 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. The license amendment is effective as of its date of issuance and shall be implemented within 120 days.

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 No. NPF-43
and Technical Specifications

Date of Issuance: September 17, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 211

RENEWED FACILITY OPERATING LICENSE NO. NPF-43

FERMI 2

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	REMOVE	INSERT
i	i	3.5-10	3.5-10
ii	ii	3.5-11	3.5-11
iii	iii	3.5-12	3.5-12
1.1-3	1.1-3	3.6-13	3.6-13
- -	1.1-3a	3.6-40	3.6-40
- -	1.1-3b	3.6-41	3.6-41
3.3-35	3.3-35	3.6-43	3.6-43
3.3-36	3.3-36	3.6-45	3.6-45
3.3-41	3.3-41	3.6-47	3.6-47
3.3-42	3.3-42	3.6-48	3.6-48
- -	3.3-49a	3.6-49	3.6-49
- -	3.3-49b	3.7-6	3.7-6
- -	3.3-49c	3.7-7	3.7-7
3.3-52	3.3-52	3.7-8	3.7-8
3.3-58	3.3-58	3.7-11	3.7-11
3.3-62	3.3-62	3.7-12	3.7-12
3.3-70	3.3-70	3.7-13	3.7-13
3.5-1	3.5-1	3.8-11	3.8-11
3.5-8	3.5-8	3.8-12	3.8-12
3.5-9	3.5-9	3.8-20	3.8-20
- -	3.5-9a	3.8-29	3.8-29
- -	3.5-9b		

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 211, 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.

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(continued)

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TABLE OF CONTENTS

(continued)

1.1 Definitions (continued)

CORE OPERATING LIMITS REPORT (COLR)	The COLR is the unit specific document that provides cycle specific parameter limits for the current reload cycle. These cycle specific limits shall be determined for each reload cycle in accordance with Specification 5.6.5. Plant operation within these limits is addressed in individual Specifications.
DOSE EQUIVALENT I-131	DOSE EQUIVALENT I-131 shall be that concentration of I-131 (microcuries/gram) that alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, AEC, 1962, "Calculation of Distance Factors for Power and Test Reactor Sites."
DRAIN TIME	The DRAIN TIME is the time it would take for the water inventory in and above the Reactor Pressure Vessel (RPV) to drain to the top of the active fuel (TAF) seated in the RPV assuming: a) The water inventory above the TAF is divided by the limiting drain rate; b) The limiting drain rate is the larger of the drain rate through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event, loss of normal power, single human error), for all penetration flow paths below the TAF except: 1. Penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are locked, sealed, or otherwise secured in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths;

(continued)

1.1 Definitions (continued)

2. Penetration flow paths capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation; or

3. Penetration flow paths with isolation devices that can be closed prior to the RPV water level being equal to the TAF by a dedicated operator trained in the task, who in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.

c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;

d) No additional draining events occur; and

e) Realistic cross-sectional areas and drain rates are used.

A bounding DRAIN TIME may be used in lieu of a calculated value.

EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME

The ECCS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ECCS initiation setpoint at the channel sensor until the ECCS equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

(continued)

1.1 Definitions (continued)

INSERVICE TESTING PROGRAM	The INSERVICE TESTING PROGRAM is the licensee program that fulfills the requirements of 10 CFR 50.55a(f).
ISOLATION SYSTEM RESPONSE TIME	The ISOLATION SYSTEM RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its isolation initiation setpoint at the channel sensor until the isolation valves travel to their required positions. Times shall include diesel generator starting and sequence loading delays, where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	B.1	--------NOTE-------- Only applicable for Functions 1.a, 1.b, 2.a, 2.b, 2.d, and 2.g. ---------- Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in both divisions
	AND		
	B.2	---------NOTE-------- Only applicable for Functions 3.a and 3.b. ---------- Declare High Pressure Coolant Injection (HPCI) System inoperable.	1 hour from discovery of loss of HPCI initiation capability
	AND		
	B.3	Place channel in trip.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. As required by Required Action A.1 and referenced in Table 3.3.5.1-1.	C.1	--------NOTE-------- Only applicable for Functions 1.c, 2.c, 2.e, and 2.f. ----------	
		Declare supported feature(s) inoperable when its redundant feature ECCS initiation capability is inoperable.	1 hour from discovery of loss of initiation capability for feature(s) in both divisions
	AND		
	C.2	Restore channel to OPERABLE status.	24 hours

(continued)

Table 3.3.5.1-1 (page 1 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Vessel Water Level – Low Low Low, Level 1	1,2,3	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 24.8 inches
b. Drywell Pressure – High	1,2,3	4(b)	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 1.88 psig
c. Reactor Steam Dome Pressure – Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 441 psig
d. Manual Initiation	1,2,3	2(c)	C	SR 3.3.5.1.6	NA

(continued)

(a) Not Used.

(b) Also required to initiate the associated emergency diesel generator (EDG).

(c) Individual component controls.

Table 3.3.5.1-1 (page 2 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Vessel Water Level – Low Low Low, Level 1	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 24.8 inches
b. Drywell Pressure – High	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 1.88 psig
c. Reactor Steam Dome Pressure – Low (Injection Permissive)	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 441 psig
d. Reactor Vessel Water Level – Low Low, Level 2 (Loop Select Logic)	1,2,3	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 103.8 inches
e. Reactor Steam Dome Pressure – Low (Break Detection Logic)	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 886 psig
f. Riser Differential Pressure – High (Break Detection)	1,2,3	4	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 0.927 psid
g. Recirculation Pump Differential Pressure – High (Break Detection)	1,2,3	4 per pump	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.3 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 1.927 psid
h. Manual Initiation	1,2,3	2(c)	C	SR 3.3.5.1.6	NA

(continued)

(c) Individual component controls.

3.3 INSTRUMENTATION

3.3.5.3 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

LCO 3.3.5.3 The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.3-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.3-1.

ACTIONS

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

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more channels inoperable.	A.1	Enter the Condition referenced in Table 3.3.5.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	B.1	Declare associated penetration flow path(s) incapable of automatic isolation.	Immediately
	AND		
	B.2	Calculate DRAIN TIME.	Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	C.1	Place channel in trip.	1 hour

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1. OR Required Action and associated Completion Time of Condition C not met.	D.1 Declare associated low pressure ECCS injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.5.3-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.5.3.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3.3	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

Table 3.3.5.3-1 (page 1 of 1)
RPV Water Inventory Control Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Steam Dome Pressure – Low (Injection Permissive)	4,5	4[(a)]	C	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 441 psig
b. Manual Initiation	4,5	1 per subsystem (a), (c)	D	SR 3.3.5.3.3	NA
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Steam Dome Pressure – Low (Injection Permissive)	4,5	4[(a)]	C	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 441 psig
b. Manual Initiation	4,5	1 per subsystem (a), (c)	D	SR 3.3.5.3.3	NA
3. RHR System Isolation					
a. Reactor Vessel Water Level – Low, Level 3	(b)	2 in one trip system	B	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 171.9 inches
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level – Low Low, Level 2	(b)	2 in one trip system	B	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 103.8 inches

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel Water Inventory Control."

(b) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

(c) Individual component controls.

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. As required by Required Action C.1 and referenced in Table 3.3.6.1-1. OR Required Action and associated Completion Time for Condition F or G not met.	H.1 Be in MODE 3. AND H.2 Be in MODE 4.	12 hours 36 hours
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 Declare associated standby liquid control subsystem (SLC) inoperable. OR I.2 Isolate the Reactor Water Cleanup System.	1 hour 1 hour
J. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	J.1 Initiate action to restore channel to OPERABLE status.	Immediately

Table 3.3.6.1-1 (page 4 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
5. Reactor Water Cleanup (RWCU) System Isolation					
a. Differential Flow – High	1,2,3	1	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	≤ 63.4 gpm
b. Area Temperature – High	1,2,3	1 per area	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	≤ 183°F
c. Area Ventilation Differential Temperature – High	1,2,3	(d)	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	≤ 53°F
d. SLC System Initiation	1,2	2(b)	I	SR 3.3.6.1.5	NA
e. Reactor Vessel Water Level – Low Low, Level 2	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	≥ 103.8 inches
f. Manual Initiation	1,2,3	1 per valve	G	SR 3.3.6.1.6	NA
6. Shutdown Cooling System Isolation					
a. Reactor Steam Dome 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	≤ 95.5 psig
b. Reactor Vessel Water Level - Low, Level 3	3	2	J	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
c. Manual Initiation	1,2,3	1 per valve	G	SR 3.3.6.1.6	NA

(continued)

(b) SLC System Initiation only inputs into one of the two trip systems.

(c) Not Used.

(d) For Function 5.c, Reactor Water Cleanup (RWCU) System Isolation, Area Ventilation Differential Temperature - High, the required channels is 1 per room.

Table 3.3.6.2-1 (page 1 of 1)
Secondary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level – Low Low, Level 2	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≥ 103.8 inches
2. Drywell Pressure – High	1,2,3	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.3 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 1.88 psig
3. Fuel Pool Ventilation Exhaust Radiation – High	1,2,3, (a)	2	SR 3.3.6.2.1 SR 3.3.6.2.2 SR 3.3.6.2.4 SR 3.3.6.2.5	≤ 6 mR/hr
4. Manual Initiation	1,2,3, (a)	1	SR 3.3.6.2.5	NA

(a) During movement of recently irradiated fuel assemblies in secondary containment.

Table 3.3.7.1-1 (page 1 of 1)
Control Room Emergency Filtration System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level – Low Low, Level 2	1,2,3	2	B	SR 3.3.7.1.1 SR 3.3.7.1.3 SR 3.3.7.1.4 SR 3.3.7.1.5 SR 3.3.7.1.6	≥ 103.8 inches
2. Drywell Pressure – High	1,2,3	2	B	SR 3.3.7.1.1 SR 3.3.7.1.3 SR 3.3.7.1.4 SR 3.3.7.1.5 SR 3.3.7.1.6	≤ 1.88 psig
3. Fuel Pool Ventilation Exhaust Radiation – High	1,2,3, (a)	2	B	SR 3.3.7.1.1 SR 3.3.7.1.3 SR 3.3.7.1.5 SR 3.3.7.1.6	≤ 6 mR/hr
4. Control Center Normal Makeup Air Radiation – High	1,2,3, (a)	1	C	SR 3.3.7.1.1 SR 3.3.7.1.2 SR 3.3.7.1.5	≤ 5 mR/hr

(a) During movement of recently irradiated fuel assemblies in the secondary containment.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.1 ECCS–Operating

LCO 3.5.1 Each ECCS injection/spray subsystem and the Automatic Depressurization System (ADS) function of five safety/relief valves shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3, except high pressure coolant injection (HPCI) and ADS valves are not required to be OPERABLE with reactor steam dome pressure ≤ 150 psig.

ACTIONS

---NOTE---
LCO 3.0.4.b is not applicable to HPCI.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One low pressure ECCS injection/spray subsystem inoperable.	A.1 Restore low pressure ECCS injection/spray subsystem to OPERABLE status.	7 days
B. One LPCI pump in both LPCI subsystems inoperable.	B.1 Restore both LPCI pumps to OPERABLE status.	7 days
C. One CSS subsystem inoperable. AND One LPCI subsystem inoperable.	C.1 Restore CSS subsystem to OPERABLE status. OR C.2 Restore LPCI subsystem to OPERABLE status.	72 hours 72 hours

(continued)

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.2 Reactor Pressure Vessel (RPV) Water Inventory Control

LCO 3.5.2 DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be ≥ 36 hours.

AND

One low pressure ECCS injection/spray subsystem shall be OPERABLE.

---NOTE---
A Low Pressure Coolant Injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.

APPLICABILITY: MODES 4 and 5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to establish a method of water injection capable of operating without offsite electrical power.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. DRAIN TIME < 36 hours and ≥ 8 hours.	C.1 Verify secondary containment boundary is capable of being established in less than the DRAIN TIME. AND	4 hours
	C.2 Verify each secondary containment penetration flow path is capable of being isolated in less than the DRAIN TIME. AND	4 hours
	C.3 Verify one standby gas treatment subsystem is capable of being placed in operation in less than the DRAIN TIME.	4 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. DRAIN TIME < 8 hours.	D.1	--------NOTE-------- Required ECCS injection/spray subsystem or additional method of water injection shall be capable of operating without offsite electrical power. ---------- Initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level > TAF for ≥ 36 hours.	Immediately
	AND		
	D.2	Initiate action to establish secondary containment boundary.	Immediately
	AND		
	D.3	Initiate action to isolate secondary containment penetration flow path or verify it can be manually isolated from the control room.	Immediately
	AND		
	D.4	Initiate action to verify one standby gas treatment subsystem is capable of being placed in operation.	Immediately

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition C or D not met. OR DRAIN TIME < 1 hour.	E.1 Initiate action to restore DRAIN TIME to ≥ 36 hours.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify, for a required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ -66 inches.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify, for a required Core Spray (CS) subsystem, the: a. Suppression pool water level is ≥ -66 inches; or b. Condensate storage tank water level is ≥ 19 ft.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.4	Verify correct voltage and breaker alignment to the LPCI swing bus.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filled with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ---------- Verify, for the required ECCS injection/spray subsystem, each 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 3.5.2.7	Operate the required ECCS injection/spray subsystem through the recirculation line for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.8	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.9	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify the required ECCS injection/spray subsystem can be manually operated.	In accordance with the Surveillance Frequency Control Program

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS), RPV WATER INVENTORY CONTROL, AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM

3.5.3 RCIC System

LCO 3.5.3 The RCIC System shall be OPERABLE.

APPLICABILITY: MODE 1,
MODES 2 and 3 with reactor steam dome pressure > 150 psig.

ACTIONS

----------NOTE----------
LCO 3.0.4.b is not applicable to RCIC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. RCIC System inoperable.	A.1 Verify by administrative means High Pressure Coolant Injection System is OPERABLE. AND	Immediately
	A.2 Restore RCIC System to OPERABLE status.	14 days
B. Required Action and associated Completion Time not met.	B.1 --------NOTE-------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition A, B, C, or D not met in MODE 1, 2, or 3.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	12 hours 36 hours
F. Required Action and associated Completion Time of Condition A, B, C, or D not met for RHR-SDC PCIV(s) required to be OPERABLE during MODE 4 or 5.	F.1 Initiate action to restore valve(s) to OPERABLE status.	Immediately

3.6 CONTAINMENT SYSTEMS

3.6.4.1 Secondary Containment

LCO 3.6.4.1 The secondary containment shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Secondary Containment inoperable due to one railroad bay access door inoperable.	A.1 Restore railroad bay door to OPERABLE status.	7 days
B. Secondary containment inoperable in MODE 1, 2, or 3 for reasons other than Condition A.	B.1 Restore secondary containment to OPERABLE status.	4 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 --------NOTE-------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Secondary containment inoperable during movement of recently irradiated fuel assemblies in the secondary containment.	D.1 --------NOTE-------- LCO 3.0.3 is not applicable. ---------- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1.1	Verify secondary containment vacuum is ≥ 0.125 inch of vacuum water gauge.	In accordance with the Surveillance Frequency Control Program

(continued)

3.6 CONTAINMENT SYSTEMS

3.6.4.2 Secondary Containment Isolation Valves (SCIVs)

LCO 3.6.4.2 Each SCIV shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

----------NOTES----------
1. Penetration flow paths may be unisolated intermittently under administrative controls.

2. Separate Condition entry is allowed for each penetration flow path.

3. Enter applicable Conditions and Required Actions for systems made inoperable by SCIVs.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more penetration flow paths with one SCIV inoperable.	A.1 Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, or blind flange. AND	8 hours (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A or B not met during movement of recently irradiated fuel assemblies in the secondary containment.	D.1 --------NOTE-------- LCO 3.0.3 is not applicable. ---------- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

3.6 CONTAINMENT SYSTEMS

3.6.4.3 Standby Gas Treatment (SGT) System

LCO 3.6.4.3 Two SGT subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One SGT subsystem inoperable.	A.1 Restore SGT subsystem to OPERABLE status.	7 days
B. Required Action and associated Completion Time of Condition A not met in MODE 1, 2, or 3.	B.1 --------NOTE-------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies in the secondary containment.	----------NOTE---------- LCO 3.0.3 is not applicable. ----------	
	C.1 Place OPERABLE SGT subsystem in operation.	Immediately
	OR	
	C.2 Suspend movement of recently irradiated fuel assemblies in secondary containment.	Immediately
D. Two SGT subsystems inoperable in MODE 1, 2, or 3.	D.1 --------NOTE-------- LCO 3.0.4.a is not applicable when entering MODE 3. ----------	
	Be in MODE 3.	12 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two SGT subsystems inoperable during movement of recently irradiated fuel assemblies in the secondary containment.	E.1 --------NOTE-------- LCO 3.0.3 is not applicable. ---------- Suspend movement of recently irradiated fuel assemblies in secondary containment.	Immediately

3.7 PLANT SYSTEMS

3.7.3 Control Room Emergency Filtration (CREF) System

LCO 3.7.3 The CREF System shall be OPERABLE.

---NOTE---
The control room envelope (CRE) boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, and 3,
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREF subsystem inoperable for reasons other than Condition B.	A.1	Restore CREF subsystem to OPERABLE status.	7 days
B. One or more CREF subsystems inoperable due to inoperable CRE boundary in MODE 1, 2, or 3.	B.1	Initiate action to implement mitigating actions.	Immediately
	AND		
	B.2	Verify mitigating actions ensure CRE occupant exposures to radiological and chemical hazards will not exceed limits and CRE occupants are protected from smoke hazards.	24 hours
	AND		
	B.3	Restore CRE boundary to OPERABLE status.	90 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 --------NOTE-------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours
D. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies in the secondary containment.	----------NOTE---------- LCO 3.0.3 is not applicable. ---------- D.1 Place OPERABLE CREF subsystem in recirculation mode. OR D.2 --------NOTE-------- Not required for a CREF System or subsystem inoperable due to failure to provide the required filtration efficiency, or due to replacement of charcoal filtration media. ---------- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two CREF subsystems or a non-redundant component or portion of the CREF System inoperable in MODE 1, 2, or 3 for reasons other than Condition B.	E.1 --------NOTE-------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	12 hours
F. Two CREF subsystems or a non-redundant component or portion of the CREF System inoperable during movement of recently irradiated fuel assemblies in the secondary containment. OR One or more CREF subsystems inoperable due to an inoperable CRE boundary during movement of recently irradiated fuel assemblies in the secondary containment.	F.1 --------NOTES-------- 1. LCO 3.0.3 is not applicable. 2. Not required for a CREF System or subsystem inoperable due to failure to provide the required filtration efficiency, or due to replacement of charcoal filtration media. ---------- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

3.7 PLANT SYSTEMS

3.7.4 Control Center Air Conditioning (AC) System

LCO 3.7.4 Two control center AC subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.
During movement of recently irradiated fuel assemblies in the secondary containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One control center AC subsystem inoperable.	A.1 Restore control center AC subsystem to OPERABLE status.	30 days
B. Two control center AC subsystems inoperable.	B.1 Verify control room area temperature <90°F. AND B.2 Restore one control center AC subsystem to OPERABLE status.	Once per 4 hours 72 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3.	C.1 --------NOTE------- LCO 3.0.4.a is not applicable when entering MODE 3. ---------- Be in MODE 3.	 12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies in the secondary containment.	----------NOTE---------- LCO 3.0.3 is not applicable ----------	
	D.1 Place OPERABLE control center AC subsystem in operation.	Immediately
	OR	
	D.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Required Action and associated Completion Time of Condition B not met during movement of recently irradiated fuel assemblies in the secondary containment.	E.1 -------NOTE---------- LCO 3.0.3 is not applicable ---------- Suspend movement of recently irradiated fuel assemblies in the secondary containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Verify the control room air temperature is ≤ 95°F.	In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment. AND	Immediately
	A.2.3 Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or both required EDGs inoperable.	B.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	B.2 Suspend movement of recently irradiated fuel assemblies in secondary containment.	Immediately
	AND	
	B.3 Initiate action to restore required EDGs to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.2.1	----------NOTE---------- The following SRs are not required to be performed: SR 3.8.1.2, SR 3.8.1.3, and SR 3.8.1.7 through SR 3.8.1.17. ---------- For AC sources required to be OPERABLE SR 3.8.1.1 through SR 3.8.1.17, are applicable.	In accordance with applicable SRs

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.1 Suspend CORE ALTERATIONS. AND	Immediately
	A.2.2 Suspend movement of recently irradiated fuel assemblies in the secondary containment. AND	Immediately
	A.2.3 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.3 Initiate actions to restore required AC and DC electrical power distribution subsystems to OPERABLE status. AND	Immediately
	A.2.4 Declare associated required shutdown cooling subsystem(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.8.1	Verify correct breaker alignments and voltage to required AC and DC electrical power distribution subsystems.	In accordance with the Surveillance Frequency Control Program

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 211

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-43

DTE ELECTRIC COMPANY

FERMI 2

DOCKET NO. 50-341

1.0 INTRODUCTION

By application dated August 31, 2017 (Reference 1), and supplemented by letters dated April 4 (Reference 2), May 17 (Reference 3), June 27 (Reference 4), and August 7, 2018 (Reference 5), DTE Electric Company (DTE, the licensee) requested to adopt Technical Specifications Task Force (TSTF) Traveler TSTF- 542, Revision 2, "Reactor Pressure Vessel Water Inventory Control" (Reference 6), for Fermi 2. The final safety evaluation (SE) for TSTF-542, Revision 2, was approved by the U.S. Nuclear Regulatory Commission (NRC, the Commission) on December 20, 2016 (Reference 7).

The proposed changes would replace existing technical specification (TS) requirements associated with "operations with a potential for draining the reactor vessel" (OPDRVs) with new and revised TSs providing alternative requirements for reactor pressure vessel (RPV) water inventory control (WIC). These alternative requirements would protect Safety Limit TS 2.1.1.3, which states "Reactor vessel water level shall be greater than the top of active irradiated fuel."

Additionally, a new definition, "DRAIN TIME," would be added to the Fermi 2 TSs, Section 1.1, "Definitions." Drain Time would establish requirements for the licensee to make RPV water level inventory determinations and to calculate RPV water inventory drain rates for Modes 4 and 5 outage-related activities. Adequate licensee management of secondary containment requirements or mitigation of certain emergency core cooling system (ECCS) safety injection/spray systems during Modes 4 and 5 requires a properly calculated Drain Time.

The licensee has proposed several variations from the TS changes described in the applicable parts of TSTF-542, Revision 2, or the NRC-approved TSTF-542 SE. These are explained below in Section 2.2.5 and evaluated in Section 3.5 of this SE.

The supplements dated April 4, May 17, June 27, and August 7, 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 November 7, 2017 (82 FR 51649).

2.0 REGULATORY EVALUATION

2.1 System Description

The boiling water reactor (BWR) RPVs have a number of penetrations located below the top of active fuel (TAF). These penetrations provide entry for control rods, recirculation flow, and shutdown cooling. Since these penetrations are below the TAF, this creates a potential to drain the reactor vessel water inventory and lose effective core cooling. The loss of water inventory and effective core cooling can potentially lead to fuel cladding failure and radioactive release.

During operation in Mode 1 (Power Operation - Reactor Mode Switch in Run), Mode 2 (Startup - Reactor Mode Switch in Refuel[1] or Startup/Hot Standby), and Mode 3 (Hot Shutdown - Reactor Mode Switch in Shutdown and average reactor coolant temperature > 200 degrees Fahrenheit (°F)), the TS for instrumentation and ECCS require operability of sufficient equipment to ensure large quantities of water will be injected into the vessel should level decrease below the preselected value. These requirements are designed to mitigate the effects of a loss-of-coolant accident (LOCA), but also provide protection for other accidents and transients that involve a water inventory loss.

During operation in Modes 4 (Cold Shutdown[1] - Reactor Mode Switch in Shutdown and average reactor coolant temperature ≤ 200 °F), and 5 (Refueling[2] - Reactor Mode Switch in Shutdown or Refuel), the pressures and temperatures that could cause a LOCA are not present. During certain phases of refueling (Mode 5) a large volume of water is available above the RPV (i.e., the RPV head is removed, the water level is ≥ 20 feet (ft) - 6 inches over the top of the RPV flange, and the spent fuel storage pool gates are removed).

The large volume of water available in and above the RPV (during much of the time when in Mode 5) provides time for operator detection and manual operator action to stop and mitigate an RPV draining event. However, typically at other times during a refueling outage, during Cold Shutdown (Mode 4) or Refueling (Mode 5), there may be a potential for significant drainage paths from certain outage activities, human error, and other events when it is more likely to have some normally available equipment, instrumentation, and systems inoperable due to maintenance and outage activities. There may not be as much time for operator action as compared to times when there are large volumes of water above the RPV.

In comparison to Modes 1, 2, and 3, with typical high temperatures and pressures (especially in Modes 1 and 2), Modes 4 and 5 generally do not have the high pressure and temperature considered necessary for a LOCA envisioned from a high energy pipe failure. Thus, while the potential sudden loss of large volumes of water from a LOCA are not expected, operators monitor for BWR RPV water level decrease from potentially significant or unexpected drainage paths. These potential drainage paths in Modes 4 and 5 generally would require less water replacement capability to maintain water above TAF.

To address the drain down potential during Modes 4 and 5, the current Fermi 2 TSs contain specifications that are applicable during an OPDRV, or require suspension of OPDRVs if certain equipment is inoperable. The term OPDRV is not specifically defined in the TSs and historically has been subject to inconsistent application by licensees. The changes discussed

---

[1] With all reactor vessel head closure bolts fully tensioned.

[2] One or more reactor vessel head closure bolts less than fully tensioned.

in this SE are intended to resolve any ambiguity by creating a new RPV WIC TS with attendant equipment operability requirements, required actions and surveillance requirements (SRs) and deleting references to OPDRVs throughout the TSs.

2.2 Proposed TS Changes

Section 2.2.1 below describes the proposed addition of a new definition, "DRAIN TIME" (evaluated below in Section 3.1).

Section 2.2.2 below describes: (1) the proposed revision to TS 3.3, "Instrumentation," (2) the proposed revision to TS 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation," (3) the proposed addition of new TS 3.3.5.3, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation" (including Table 3.3.5.3), and (4) the proposed revision to TS 3.3.6.1, "Primary Containment Isolation Instrumentation" (evaluation in Sections 3.2 and 3.4 of this SE).

Section 2.2.3 below describes the proposed revision to TS 3.5, "Emergency Core Cooling System (ECCS) and Reactor Core Isolation Cooling (RCIC) System," which includes the proposed revision to TS 3.5.2 "ECCS-Shutdown" (evaluation in Section 3.3 of this SE).

Section 2.2.4 below describes the proposed deletion of existing TS references to OPDRVs (evaluated below in Section 3.6).

Section 2.2.5 below describes Fermi 2 plant-specific variations to TSTF-542, Revision 2 (evaluated below in Section 3.5).

2.2.1 Addition of "DRAIN TIME" Definition

The following definition of "DRAIN TIME" would be added to Section 1.1, "Definitions":

> The DRAIN TIME is the time it would take for the water inventory in and above the Reactor Pressure Vessel (RPV) to drain to the top of the active fuel (TAF) seated in the RPV assuming:
>
> a) The water inventory above the TAF is divided by the limiting drain rate;
>
> b) The limiting drain rate is the larger of the drain rate through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure (e.g., seismic event, loss of normal power, single human error), for all penetration flow paths below the TAF except:
>
> 1. Penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are locked, sealed, or otherwise secured in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths;
>
> 2. Penetration flow paths capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level

being equal to the TAF when actuated by RPV water level isolation instrumentation; or

3. Penetration flow paths with isolation devices that can be closed prior to the RPV water level being equal to the TAF by a dedicated operator trained in the task, who in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.

c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;

d) No additional draining events occur; and

e) Realistic cross-sectional areas and drain rates are used.

A bounding DRAIN TIME may be used in lieu of a calculated value.

2.2.2 TS 3.3, "Instrumentation"

The following subsections describe the existing and proposed changes to the Fermi 2 TS, Section 3.3, "INSTRUMENTATION."

2.2.2.1 TS 3.3.5.1, "Emergency Core Cooling System (ECCS) Instrumentation"

Proposed changes to TS 3.3.5.1 include the deletion of Note 1 in Required Actions B.1 and C.1, which states:

Only applicable in MODES 1, 2, and 3.

As a result, the numbering for Note 2 would be removed with no change in the note.

For TS Table 3.3.5.1-1, the applicability in Modes 4 and 5 was proposed for deletion because the instrumentation requirements during shutdown would be consolidated into the new TS 3.3.5.3, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation." Modes 4 and 5 applicability and associated requirements would be deleted for the following functions:

1. Core Spray System

(a) Reactor Vessel Water Level - Low Low Low, Level 1
(c) Reactor Steam Dome Pressure - Low (Injection Permissive)
(d) Manual Initiation

2. Low Pressure Coolant Injection (LPCI) System

(a) Reactor Vessel Water Level - Low Low Low, Level 1
(c) Reactor Steam Dome Pressure - Low (Injection Permissive)

(d) Reactor Vessel Water Level - Low Low, Level 2 (Loop Select Logic)
(e) Reactor Steam Dome Pressure - Low (Break Detection Logic)
(h) Manual Initiation

Table 3.3.5.1-1 footnote (a), which states, "When the associated subsystem(s) of LCO [limiting condition for operation] 3.5.2 are required to be OPERABLE," would be deleted and footnote (a) would not be used for this table and would be replaced with "Not Used."

2.2.2.2 New TS 3.3.5.3, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation"

The proposed new TS 3.3.5.3 would contain existing ECCS and Primary Containment Isolation instrumentation functions that would be relocated from TSs 3.3.5.1 and 3.3.6.1, as well as new TS requirements. The proposed new TS 3.3.5.3 is shown below:

3.3.5.3 Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation

LCO 3.3.5.3 The RPV Water Inventory Control instrumentation for each Function in Table 3.3.5.3-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.5.3-1.

ACTIONS

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

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.5.3-1 for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	B.1 Declare associated penetration flow path(s) incapable of automatic isolation. AND B.2 Calculate DRAIN TIME.	Immediately Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	C.1 Place channel in trip.	1 hour

D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1. OR Required Action and associated Completion Time of Condition C not met.	D.1 Declare associated low pressure ECCS injection/spray subsystem inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------

Refer to Table 3.3.5.3-1 to determine which SRs apply for each ECCS Function.

SURVEILLANCE	FREQUENCY
SR 3.3.5.3.1 Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.3.2 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.
SR 3.3.5.3.3 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program.

Table 3.3.5.3-1 (Page 1 of 1)
RPV Water Inventory Control Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Core Spray System					
a. Reactor Steam Dome Pressure - Low (Injection Permissive)	4,5	4 (a)	C	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 441 psig
b. Manual Initiation	4,5	1 per subsystem (a), (c)	D	SR 3.3.5.3.3	NA
2. Low Pressure Coolant Injection (LPCI) System					
a. Reactor Steam Dome Pressure - L ow (Injection Permissive)	4,5	4 (a)	C	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 441 psig
b. Manual Initiation	4,5	1 per subsystem (a), (c)	D	SR 3.3.5.3.3	NA
3. RHR System Isolation					
a. Reactor Vessel Water Level - Low, Level 3	(b)	2 in one trip system	B	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 171.9 inches
4. Reactor Water Cleanup (RWCU) System Isolation					
a. Reactor Vessel Water Level - Low Low, Level 2	(b)	2 in one trip system	B	SR 3.3.5.3.1 SR 3.3.5.3.2	≥ 103.8 inch es

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "Reactor Pressure Vessel Water Inventory Control."

(b) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.

(c) Individual component controls.

2.2.2.3 TS 3.3.6.1, "Primary Containment Isolation Instrumentation"

In TS Table 3.3.6.1-1, Function 6.b, Shutdown Cooling System Isolation, Reactor Vessel Water Level - Low, Level 3, the applicability in Modes 4 and 5 was proposed for deletion. Also, footnote (c) to Table 3.3.6.1-1 was proposed to be deleted (replaced with "Not Used"), as it is applicable only to Function 6.b during Modes 4 and 5. This function would be moved to the new TS Table 3.3.5.3-1, Function 3.a, as shown in Section 2.2.2.2 of this SE.

In TS LCO 3.3.6.1, Required Action J.2 was proposed for deletion since it was associated with the isolation of residual heat removal (RHR)/shutdown cooling (SDC) during Modes 4 and 5.

2.2.3 TS Section 3.5, "Emergency Core Cooling System (ECCS) and Reactor Core Isolation Cooling (RCIC) System"

The title of Fermi 2 TS Section 3.5 would be revised from "Emergency Core Cooling System (ECCS) and Reactor Core Isolation Cooling (RCIC) System" to "Emergency Core Cooling Systems (ECCS), RPV Water Inventory Control, and Reactor Core Isolation Cooling (RCIC) System."

The title of Fermi 2 TS Section 3.5.2 would be revised from "ECCS - Shutdown" to "Reactor Pressure Vessel (RPV) Water Inventory Control." Also, TS 3.5.2 would be revised as follows:

LCO 3.5.2 DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be ≥ 36 hours.

AND

One low pressure ECCS injection/spray subsystem shall be OPERABLE.

----------NOTE----------
A Low Pressure Coolant Injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.

APPLICABILITY: MODES 4 and 5

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required ECCS injection/spray subsystem inoperable.	A.1 Restore required ECCS injection/spray subsystem to OPERABLE status.	4 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action to establish a method of water injection capable of operating without offsite electrical power.	Immediately

C. DRAIN TIME < 36 hours and ≥ 8 hours.	C.1 Verify secondary containment boundary is capable of being established in less than the DRAIN TIME. AND C.2 Verify each secondary containment penetration flow path is capable of being isolated in less than the DRAIN TIME. AND C.3 Verify one standby gas treatment subsystem is capable of being placed in operation in less than the DRAIN TIME.	4 hours 4 hours 4 hours

D. DRAIN TIME < 8 hours.	D.1----------NOTE---------- Required ECCS injection/spray subsystem or additional method of water injection shall be capable of operating without offsite electrical power. ---------- Initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level > TAF for ≥ 36 hours. AND D.2 Initiate action to establish secondary containment boundary. AND D.3 Initiate action to isolate each secondary containment penetration flow path or verify it can be manually isolated from the control room. AND D.4 Initiate action to verify one standby gas treatment subsystem is capable of being placed in operation.	Immediately Immediately Immediately Immediately
E. Required Action and associated Completion Time of Condition C or D not met. OR DRAIN TIME < 1 hour.	E.1 Initiate action to restore DRAIN TIME to ≥ 36 hours.	Immediately

The proposed SRs for TS 3.5.2 are shown below:

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify DRAIN TIME ≥ 36 hours.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	Verify, for a required low pressure coolant injection (LPCI) subsystem, the suppression pool water level is ≥ - 66 inches.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.3	Verify, for a required Core Spray (CS) subsystem, the: a. Suppression pool water level is ≥ - 66 inches; or b. Condensate storage tank water level is ≥ 19 ft.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.4	Verify correct voltage and breaker alignment to the LPCI swing bus.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	Verify, for the required ECCS injection/spray subsystem, locations susceptible to gas accumulation are sufficiently filler with water.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	----------NOTE---------- Not required to be met for system vent flow paths opened under administrative control. ---------- Verify, for the required ECCS injection/spray subsystem, each 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 3.5.2.7	Operate the required ECCS injection/spray subsystem through the recirculation line for ≥ 10 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.8	Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal.	In accordance with the Surveillance Frequency Control Program

SR 3.5.2.9	----------NOTE---------- Vessel injection/spray may be excluded. ---------- Verify the required ECCS injection/spray subsystem actuated can be manually operated.	In accordance with the Surveillance Frequency Control Program

2.2.4 Deletion of Reference to OPDRVs

In References 1, 2, 3, 4, and 5, the licensee proposed to revise current TS requirements related to OPDRVs (or terms related to OPDRVs) with new requirements on RPV WIC that will protect TS Safety Limit 2.1.1.3. To remain consistent with TSTF 542, all references to the term OPDRVs in the TSs would be deleted. The following table lists the TS location of these references:

Fermi 2 LCO	Location of OPDRVs Reference
3.3.6.1, Primary Containment Isolation Instrumentation	Table 3.3.6.1-1 footnote (c)
3.3.6.2, Secondary Containment Isolation Instrumentation	Table 3.3.6.2-1 footnote (a)
3.3.7.1, Control Room Emergency Filtration (CREF) System Instrumentation	Table 3.3.7.1-1 footnote (a)
3.6.1.3, Primary Containment Isolation Valves (PCIVs)	Required Action F
3.6.4.1, Secondary Containment	Applicability, Condition D
3.6.4.2, Secondary Containment Isolation Valves (SCIVs)	Applicability, Condition D
3.6.4.3, Standby Gas Treatment (SGT) System	Applicability, Conditions C and E
3.7.3, Control Room Emergency Filtration (CREF) System	Applicability, Conditions D and F
3.7.4, Control Center Air Conditioning (AC) System	Applicability, Conditions D and E
3.8.2, AC Sources - Shutdown	Conditions A and B Required Actions A.2.4 and B.4 are renumbered as A.2.3 and B.3, respectively
3.8.5, DC Sources - Shutdown	Condition A Required Action A.2.4 is renumbered as A.2.3
3.8.8, Distribution Systems - Shutdown	Condition A Required Actions A.2.4 and A.2.5 are renumbered as A.2.3 and A.2.4, respectively

2.2.5 Fermi 2 Plant-Specific TSTF-542 Variations

In References 1, 2, 3, 4, and 5, the licensee identified several Fermi 2 plant-specific TS variations from TSTF-542, Revision 2 (Reference 6), or the NRC-approved TSTF-542 SE (Reference 7). The licensee stated that these variations do not affect the applicability of TSTF-542 or the NRC staff's SE to the proposed license amendment. Section 3.5 of this SE includes the staff's evaluation of each of these technical variations.

2.2.5.1 Variation 1, SR 3.5.2.5 Note

Fermi 2 SR 3.5.2.5 contains Note 1 regarding realignment to the LPCI mode from the decay heat removal mode, which is similar to the Note in the Standard Technical Specifications (STS) LCO 3.5.2. DTE proposed to delete Note 1, which applies only to SR 3.5.2.5, and insert a similar note that will apply the exception to the overall LCO for 3.5.2, to be consistent with the STSs.

2.2.5.2 Variation 2, CS and LPCI Pump Discharge Flow Low

The proposed Fermi 2 TS 3.3.5.3, Table 3.3.5.3-1, does not include functions corresponding to STS Table 3.3.5.1-1, Function 1.d, "Core Spray Pump Discharge Flow – Low (Bypass)," and Function 2.g, "Low Pressure Coolant Injection Pump Discharge Flow – Low (Bypass)," since the Fermi 2 TS does not currently contain these functions in TS Table 3.3.5.1-1.

2.2.5.3 Variation 3, LPCI Loop Select Logic and Break Detection Logic

Fermi 2 TS Table 3.3.5.1-1, Function 2.d, "Reactor Vessel Water Level - Low Low, Level 2 (Loop Select Logic)," and Function 2.e, "Reactor Steam Dome Pressure - Low (Break Detection Logic)," are not included in the STS Table 3.3.5.1-1. Functions 2.d and 2.e automatically enable and initiate LPCI loop select logic. Loop select logic is initiated on the decreasing RPV water level at Level 2. The logic then has time to detect a broken recirculation loop and select the unbroken recirculation loop for LPCI injection.

2.2.5.4 Variation 4, CS and LPCI Individual Component Controls (Manual Initiation) and Proposed Revision to SR 3.5.2.9 (Manual Operated)

The NRC staff found that the licensee's use of the term "manual initiation channel" is inconsistent with the design assumptions in TSTF-542 and the STS in general. As a result, this section contains a discussion of the clarifications and revisions to the original license amendment request (LAR) (Reference 1) with regard to the requirements for ECCS manual initiation.

The required channels for Fermi 2 TS Table 3.3.5.1-1, Function 1.d, "Manual Initiation," of the CS system, and Function 2.h, "Manual Initiation" of the LPCI system, are modified by a footnote stating, "Individual component controls." The footnote is retained for the manual initiation functions of the CS system and the LPCI system in the proposed TS Table 3.3.5.3-1, as footnote (c) consistent with the current Fermi 2 TS requirements.

In Reference 3, DTE revised SR 3.5.2.9 from that which was proposed in Reference 1, to reflect the existing Fermi 2 ECCS design, in which manual initiation occurs by means of individual component controls. The proposed SR 3.5.2.9 would require verification that the required ECCS subsystem can be manually operated. The proposed SR aligns with the

proposed TS Table 3.3.5.3-1 footnote (c), which states that the Manual Initiation function of the CS and LPCI systems is by means of individual component controls and is an acceptable, plant-specific variation from TSTF-542, Revision 2.

In Reference 4, DTE proposed to revise SR 3.3.5.3.3, as indicated in Enclosure 2, from "Perform LOGIC SYSTEM FUNCTIONAL TEST" to "Perform CHANNEL FUNCTIONAL TEST."

In Reference 5, DTE proposed to revise TS LCO 3.3.5.3 Condition D by changing the 24-hour Completion Time to "Immediately" for restoration of an inoperable CS or LPCI system Manual Initiation Function. Proposed Condition D would also be combined with the Condition E that was proposed in Reference 1. The originally proposed TS LCO 3.3.5.3 Conditions D and E from Reference 1 are shown below.

D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1.	D.1 Restore channel to OPERABLE status.	24 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1 Declare associated low pressure ECCS injection/spray subsystem inoperable.	Immediately

Newly proposed Condition D in Reference 5:

D. As required by Required Action A.1 and referenced in Table 3.3.5.3-1. OR Required Action and associated Completion Time of Condition C not met.	D.1 Declare associated low pressure ECCS injection/spray subsystem inoperable.	Immediately

2.2.5.5 Variation 5, TS 3.6.1.3, Action F.1 (RHR/SDC Isolation)

Fermi 2 TS 3.6.1.3 Required Action F.1 requires the licensee to initiate action to isolate RHR-Shutdown Cooling System. This action differs slightly from STS 3.6.1.3 Required Action H.1 to initiate action to suspend OPDRVs; however, both actions direct immediate action to isolate PCIVs to prevent inadvertent draindown.

2.2.5.6 Variation 6, Administrative Change to TS 3.6.4.2 Title

The licensee proposes to add a closed parenthesis to the title of TS 3.6.4.2, "Secondary Containment Isolation Valves (SCIVs)." This is an administrative change.

2.3 Applicable Regulatory Requirements

The regulation in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(a)(1) requires an applicant for an operating license to include in the application proposed TSs in accordance with the requirements of 10 CFR 50.36. The applicant must also include in the application, a "summary statement of the bases or reasons for such specifications, other than those covering administrative controls." However, per 10 CFR 50.36(a)(1), these TS bases "shall not become part of the technical specifications."

As required by 10 CFR 50.36(c), TSs will include items in the category of safety limits, limiting safety system settings, and limiting control settings. Section 50.36(c)(1) states, in part, that safety limits for nuclear reactors are limits upon important process variables that are found to be necessary to reasonably protect the integrity of certain of the physical barriers that guard against the uncontrolled release of radioactivity. If any safety limit is exceeded, the reactor must be shut down. The licensee shall notify the Commission, review the matter, and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude recurrence. Operation must not be resumed until authorized by the Commission.

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. Per 10 CFR 50.36(c)(2)(i), 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 regulation at 10 CFR 50.36(c)(2)(ii) requires licensees to establish TS LCOs for items meeting one or more of the listed criteria. Specifically, Criterion 4, "A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety," supports the establishment of LCOs for RPV WIC due to insights gained via operating experience.

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.

Pursuant to 10 CFR 50.90, whenever a holder of an operating license desires to amend the license, application for an amendment must be filed with the Commission fully describing the changes desired, and following as far as applicable, the form prescribed for original applications. The technical information to be included in an application for an operating license is governed in particular by 10 CFR 50.34(b).

As described in 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses to the extent applicable and appropriate. The general considerations that guide the Commission include, as stated in 10 CFR 50.40(a), how the TSs

provide reasonable assurance that the health and safety of the public will not be endangered. Also, to issue an operating license, of which TSs are a part, the Commission must make the findings of 10 CFR 50.57, including the 10 CFR 50.57(a)(3)(i) finding that there is reasonable assurance that the activities authorized by the operating license can be conducted without endangering the health and safety of the public.

NUREG-1433, Revision 4 (Reference 9 and 10), contains the STS for BWR/4 plants; and is part of the regulatory standardization effort. The NRC staff has prepared STSs for each of the light-water reactor nuclear designs. The approved changes to the STS in TSTF-542 will be incorporated into future revisions of NUREG 1433, Volumes 1 and 2. Fermi 2 is a BWR/4 plant and is aligned with the BWR/4 STS, without a setpoint control program.

The NRC staff's guidance for review of TSs is in Chapter 16, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," dated March 2010 (Reference 8).

2.3.1 Fermi 2 Applicable Regulatory Design Requirements

Fermi 2 Updated Final Safety Analysis Report (UFSAR), Section 3.1, "Conformance with General Design Criteria," contains an evaluation of the design basis of Fermi 2 as measured against the General Design Criteria (GDC) for Nuclear Power Plants, Appendix A, 10 CFR Part 50, effective May 21, 1971, and subsequently amended July 7, 1971. The following criteria from the Fermi 2 UFSAR are related to this LAR.

Criterion 13 - Instrumentation and Control. Instrumentation shall 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, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

Criterion 14 - Reactor Coolant Pressure Boundary. The reactor coolant pressure boundary shall be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture.

Criterion 30 - Quality of Reactor Coolant Pressure Boundary. Components which are part of the reactor coolant pressure boundary shall be designed, fabricated, erected, and tested to the highest quality standards practical. Means shall be provided for detecting and, to the extent practical, identifying the location of the source of reactor coolant leakage.

Criterion 33 - Reactor Coolant Makeup. A system to supply reactor coolant makeup for protection against small breaks in the reactor coolant pressure boundary shall be provided. The system safety function shall be to assure that specified acceptable fuel design limits are not exceeded as a result of reactor coolant loss due to leakage from the reactor coolant pressure boundary and rupture of small piping or other small components which are part of the boundary. The system shall be designed to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished using the piping, pumps, and valves used to maintain coolant inventory during normal reactor operation.

Criterion 35 - Emergency Core Cooling. A system to provide abundant emergency core cooling shall be provided. The system safety function shall be 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. Suitable redundancy in components and features, and suitable interconnections, leak detection, isolation, and containment capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure.

3.0 TECHNICAL EVALUATION

Section 2.2 of this SE lists the proposed TS changes, as described in References 1, 2, 3, 4, and 5, for the licensee to adopt TSTF-542, Revision 2. The following sections summarize the NRC staff's evaluation of each of these proposed changes.

3.1 Staff Evaluation of Proposed "DRAIN TIME" Definition

As discussed in Section 2.2.1 of this SE, the "DRAIN TIME" is the time it would take the RPV water inventory to drain from the current level to the TAF, assuming the most limiting of the RPV penetrations flow paths with the largest flow rate, or a combination of penetration flow paths that could open due to a common mode failure, were to open and the licensee took no mitigating action.

The NRC staff reviewed the proposed "DRAIN TIME" definition from TSTF-542. For the purpose of NRC staff considerations, the term "break" describes a pathway for water to drain from the RPV that has not been prescribed in the "DRAIN TIME" definition in TSTF-542. Based on information furnished by the licensee, the NRC staff has determined that the licensee is appropriately adopting the definition of drain time as specified in TSTF-542.

The NRC staff has reasonable assurance that the licensee will include all RPV penetrations below the TAF in the determination of DRAIN TIME as potential pathways. As part of this evaluation, the staff reviewed requests for additional information used during the development of TSTF-542, Revision 2, which provided examples of bounding drain time calculations for three examples: (1) water level at or below the RPV flange; (2) water level above the RPV flange with fuel pool gates installed; and (3) water level above the RPV flange with fuel pool gates removed. The drain time is calculated by taking the water inventory above the break and dividing by the limiting drain rate until the TAF is reached. The limiting drain rate is a variable parameter depending on the break size and the reduction of elevation head above break location during the drain down event. The discharge point will depend on the lowest potential drain point for each RPV penetration flow path on a plant-specific basis. This calculation provides a conservative approach to determining the drain time of the RPV.

The NRC staff concluded that the licensee will use methods resulting in conservative calculations to determine RPV drain time, thereby, protecting TS Safety Limit 2.1.1.3, which meets the requirements of 10 CFR 50.36(c)(3). Based on these considerations, the NRC staff has determined that the licensee's proposed addition of the drain time definition to the Fermi 2 TSs is acceptable.

3.2 Staff Evaluation of Proposed TS 3.3.5.3, "Reactor Pressure Vessel (RPV) Water Inventory Control Instrumentation"

The purpose of the proposed new TS 3.3.5.3 regarding RPV WIC instrumentation is to support the requirements of revised TS LCO 3.5.2, and the proposed new definition of drain time. There are instrumentation and controls required for manual pump starts or required as a permissive or operational controls on the systems that provide water injection capability, certain start commands, pump protection, and isolation functions. These instruments are required to be operable if the systems that provide water injection and isolation functions are to be considered operable, as described in Section 3.3 of this SE, the evaluation for revised TS 3.5.2.

For Fermi 2, reactor operators have alternate means, often requiring several more steps, to start and inject water than the preferred simple push button start, but these actions can still be accomplished within the time frames assumed in the development of TSTF-542.

Specifically, the proposed new TS 3.3.5.3 supports operation of the CS and LPCI systems when needed, as well as, the system isolation of the RHR system and the RWCU system. The equipment involved with each of these systems is described in the evaluation of TS 3.5.2 and the Bases for LCO 3.5.2. The following sections evaluate the various parts of the new TS 3.3.5.3.

3.2.1 Staff Evaluation of Proposed TS 3.3.5.3 LCO and Applicability

In References 1, 2, 3, 4, and 5, the licensee proposed a new TS 3.3.5.3 to provide alternative instrumentation requirements to support manual initiation of the ECCS injection/spray subsystem and for automatic isolation of penetration flow paths that may be credited in the determination of drain time. The current TSs contain instrumentation requirements related to OPDRVs in TS Table 3.3.5.1-1, TS Table 3.3.6.1-1, TS Table 3.3.6.2-1, and TS 3.3.7.1. The requirements from Tables 3.3.5.1-1 and Table 3.3.6.1-1, would be consolidated into new TS 3.3.5.3. The OPDRVs requirements in Tables 3.3.6.2-1 and 3.3.7.1-1, would be deleted, as discussed in Section 3.6 of this SE.

The proposed LCO 3.3.5.3 would state:

> The RPV Water Inventory Control instrumentation for each function in Table 3.3.5.3-1 shall be OPERABLE.

The proposed Applicability would state:

> According to Table 3.3.5.3-1.

A table in TSTF-542 contains those instrumentation Functions needed to support manual initiation of the ECCS injection/spray subsystem required by LCO 3.5.2, and for automatic isolation of penetration flow paths that may be credited in a calculation of drain time. The functions that are required in Modes 4 or 5, or during OPDRVs, are relocated to Table 3.3.5.3-1 and are moved from existing TS 3.3.5.1 and TS 3.3.6.1. Creation of TS 3.3.5.3 places these functions in a single location with requirements appropriate to support the safety function for TS 3.5.2.

The NRC staff concluded that the licensee's proposed alternative is acceptable for Fermi 2 since, at a minimum, either a CS or LPCI subsystem would be available to perform the intended function to inject water into the RPV; therefore, this meets the intent of the NRC-approved TSTF-542.

3.2.2 Staff Evaluation of Proposed TS 3.3.5.3 Actions

Section 2.2.2.2 of this SE describes the proposed Actions for the licensee's proposed new TS 3.3.5.3. The NRC staff has determined that these Actions provide effective remedial measures for when one or more instrument channels are inoperable or the equipment and function controlled by these instruments cannot complete the required function in the normal manner. The Actions are evaluated as follows.

> Action A would be applicable when one or more instrument channels are inoperable from Table 3.3.5.3-1 and directs the licensee to immediately enter the Condition referenced in Table 3.3.5.3-1 for that channel.
>
> Action B (concerning the RHR system isolation and RWCU system isolation Functions) would be applicable when automatic isolation of the associated penetration flow path is credited as a path for potential drainage in calculating drain time. If the instrumentation is inoperable, Required Action B.1 directs an immediate declaration that the associated penetration flow path(s) are incapable of automatic isolation. Required Action B.2 requires an immediate re-calculation of drain time, but automatic isolation of the affected penetration flow paths cannot be credited.
>
> Action C (concerning low reactor steam dome pressure permissive Functions necessary for ECCS subsystem manual injection valve opening) would address an event in which the permissive is inoperable. If the permissive is inoperable, manual initiation of ECCS is prohibited. Therefore, the permissive must be placed in the trip condition within 1 hour. With the permissive in the trip condition, manual initiation may be performed. Prior to placing the permissive in the trip condition, the operator can take manual control of the pump and the injection valve to inject water into the RPV. The completion time of one hour is intended to allow the operator time to evaluate any discovered inoperabilities and to place the channel in trip.
>
> Action D would apply if the Manual Initiation Function (via individual component controls) is inoperable, or if the Required Action and associated Completion Time of Condition C were not met.
>
> If the Manual Initiation Function is inoperable, the associated low pressure ECCS injection/spray subsystem may be incapable of performing the intended function, and must be declared inoperable immediately.
>
> With the Required Action and associated Completion Time of Condition C not met, the associated low pressure ECCS injection/spray subsystem may be incapable of performing the intended function, and must be declared inoperable immediately.

These Actions direct the licensee to take appropriate actions and enter into the Conditions referenced in Table 3.3.5.3-1. The NRC staff has determined that these Actions satisfy the requirements of 10 CFR 50.36(c)(2)(i) by providing remedial actions permitted by the TSs until

the LCO can be met. Therefore, the NRC staff concludes that there is reasonable assurance that the licensee will take appropriate actions during an unexpected drain event to either prevent or to mitigate RPV water level being lowered to the TAF and therefore, that the propose Actions are acceptable.

3.2.3 Staff Evaluation of Proposed TS 3.3.5.3 Surveillance Requirements

The proposed new TS 3.3.5.3 SRs include Channel Checks and Channel Functional Tests numbered SR 3.3.5.3.1, SR 3.3.5.3.2, and SR 3.3.5.3.3.

The NRC staff finds that these tests are sufficient and adequate, because they will ensure that the Functions of TS 3.3.5.3 are operable (i.e., capable of performing the specified safety function in support of TS 3.5.2, and protection from a potential drain down of the RPV in Modes 4 and 5). The NRC staff also finds that the proposed SRs of LCO 3.3.5.3 are acceptable and concludes that these SRs satisfy 10 CFR 50.36(c)(3) by providing the specific SRs relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained.

The proposed SRs are as follows.

SR 3.3.5.3.1

SR 3.3.5.3.1 would require a Channel Check and applies to all functions, except the Manual Initiation. Performance of the Channel Check would ensure that a failure of instrumentation has not occurred. A Channel Check is normally a comparison of the parameter indicated on one channel to a similar parameter on other related channels. A Channel Check is significant in assuring that there is a low probability of an undetected complete channel failure and is a key safety practice to verifying the instrumentation continues to operate properly between each Channel Functional Test. The frequency, in accordance with the surveillance frequency control program (SFCP), is consistent with the current Fermi 2 requirements and supports operating shift situational awareness.

SR 3.3.5.3.2 and SR 3.3.5.3.3

SR 3.3.5.3.2 would require a Channel Functional Test and applies to Reactor Steam Dome Pressure – Low (Injection Permissive) for the CS and LPCI systems, RHR System Isolation, and RWCU system Isolation Functions.

SR 3.3.5.3.3 would require a Channel Functional Test and applies to the CS and LPCI systems Manual Initiation Functions.

A Channel Functional Test is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This is acceptable because all of the other required contacts of the relay are verified by other TSs and non-TSs tests. The frequency would be in accordance with the Surveillance Frequency Control Program. The licensee stated in Reference 4 that the reasoning for these two SRs with the same test is that the frequencies are different. The baseline frequencies are 92 days for SR 3.3.5.3.2 and 18 months for SR 3.3.5.3.3; this information is not obvious due to the reference to the Surveillance Frequency Control Program in both SRs. The licensee proposed to structure the Channel Functional Test SRs similar to

the current requirements found in TS 3.3.5.1, from which the Modes 4 and 5 requirements of the functions were relocated.

TSTF-542 did not include SRs to verify or adjust the instrument setpoint derived from the allowable value using a Channel Calibration or a surveillance to calibrate the trip unit. This is because a draining event in Modes 4 or 5 is not an analyzed accident and, therefore, there is no accident analysis on which to base the calculation of a setpoint. The Functions required to be operable permit ECCS manual initiation or automatic isolation of a penetration flow path, but no specific RPV water level is assumed for those actions. Therefore, the allowable value for Mode 3 was chosen for use in Modes 4 and 5 as it will perform the desired function. Calibrating the Functions in Modes 4 and 5 is not necessary, as TSs 3.3.5.1 and 3.3.6.1 continue to require the Functions to be calibrated on an established interval.

The NRC staff has determined that the Mode 3 allowable value and established calibration intervals are adequate to ensure that the channel will respond with the required accuracy to allow manual initiation of the pumping systems to inject water and automatic isolation of penetration flow paths.

Based on the above, the NRC staff concludes that the proposed SRs of LCO 3.3.5.3 satisfy 10 CFR 50.36(c)(3) by providing the specific SRs relating to test, calibration, or inspection to assure that the necessary operability of systems and components is maintained and are, therefore, acceptable.

3.2.4 Staff Evaluation of Proposed Table 3.3.5.3-1, "RPV Water Inventory Control Instrumentation"

In order to support the requirements of proposed TS 3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control," the associated instrumentation requirements would be designated in Table 3.3.5.3-1. These instruments would be required to be operable if the systems that provide water injection and isolation functions were to be considered operable as described in the NRC staff's evaluation of TS 3.5.2.

The NRC staff finds the table to be acceptable because it sufficiently discusses the purpose of the functions, the applicability, the number of required channels, the references to the Condition to be entered by letter (e.g., A, B, C) if the function is inoperable, the applicable SRs, and the selection of the allowable value, and justification of differences between the existing and proposed TS functions.

In addition, NRC staff finds that the RPV WIC Instrumentation table is acceptable, because it is adequate to ensure that the instrument channels respond permitting pump systems to inject water when needed, and isolation equipment to activate when commanded to support prevention or mitigation of a potential RPV draining event.

Each of the low pressure ECCS subsystems in Modes 4 and 5 can be started by manual alignment of ECCS pumps and valves by individual component controls. Automatic initiation of an ECCS injection/spray subsystem may be undesirable because it could lead to overflowing the RPV cavity, due to injection rates of thousands of gallons per minute (gpm). Considering the action statements as the drain time decreases (e.g., the proposed TS 3.5.2, Action E, prohibits plant conditions that could result in drain times less than one hour), there is sufficient time for the reactor operators to take manual action to stop the draining event, and to manually start an ECCS injection/spray subsystem or additional method of water injection

as needed. Consequently, there is no need for automatic initiation of ECCS to respond to an unexpected draining event. The NRC staff finds this acceptable because a draining event is a slow evolution when compared to a design basis LOCA assumed to occur at a significant power level.

3.2.4.1 Staff Evaluation of Proposed Table 3.3.5.3-1 Functions

The signals from Table 3.3.5.3-1 Functions 1.a (CS) and 2.a (LPCI), Reactor Steam Dome Pressure - Low (Injection Permissive), would be used as permissives for the low pressure ECCS injection/spray subsystem manual initiation functions. This function would ensure that the reactor pressure has fallen to a value below these subsystems' maximum design pressure before permitting the operator to open the injection valves of the low pressure ECCS subsystems. Even though the reactor steam dome pressure is expected to be below the ECCS maximum design pumping pressure during Modes 4 and 5, the Reactor Pressure - Low signals would be required to be operable and capable of permitting initiation of the ECCS. The proposed allowable value would be ≥ 441 psig, with four required channels per function, as it is currently in Fermi 2 TS Table 3.3.5.1-1.

The instruments for Table 3.3.5.3-1 include Functions 1.b (CS) and 2.b (LPCI), the Manual Initiation channels, which provide manual initiation capability by means of individual component controls. There is one manual initiation channel for each of the CS and LPCI subsystems (i.e., four for CS and four for LPCI). There are no Allowable Values for these functions since the channels are mechanically actuated based solely on the position of the individual components. Each channel of the Manual Initiation Function is only required to be operable in Modes 4 and 5, when the associated ECCS subsystems are required to be OPERABLE per LCO 3.5.2. In addition, these two Functions have footnote (c), which would state, "Individual component controls." The use of this footnote is further described in Section 3.5.4 of this SE (Variation 4).

Table 3.3.5.3-1, Function 3.a, RHR System Isolation, Reactor Vessel Water Level - Low, Level 3, would only be required to be operable when automatic isolation of the associated penetration flow path is credited in the drain time calculation. The proposed number of required instrument channels is 2 in one trip system. Reactor Vessel Water Level - Low, Level 3 signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels (two channels per trip system) of the Reactor Vessel Water Level - Low, Level 3 Function are available and are required to be operable to ensure that no single instrument failure can preclude the isolation function. The allowable value was chosen to be the same as the current Primary Containment Isolation Instrumentation, Reactor Vessel Water Level - Low, Level 3 Allowable Value (Function 6.b) from LCO 3.3.6.1, which is ≥ 171.9 inches.

For Table 3.3.5.3-1 Function 4.a, RWCU System Isolation, Reactor Vessel Water Level - Low Low, Level 2, the function is only required to be operable when automatic isolation of the associated penetration flow path is credited in the drain time calculation. The proposed number of required instrument channels is 2 in one trip system. Reactor Vessel Water Level - Low Low, Level 2 signals are initiated from four level transmitters that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. While four channels (two channels per trip system) of the Reactor Vessel Water Level - Low Low, Level 2 Function are available, only two channels (both in the same trip system) are required to be Operable. This

proposed change is a new requirement in Modes 4 and 5 for the RWCU system. However, the instrumentation function is the same as TS Table 3.3.6.1, Function 5.e, which contains the requirements for Modes 1, 2, and 3, with the same allowable value of ≥ 103.8 inches.

The NRC staff finds that the proposed new LCO 3.3.5.3 correctly specifies the lowest functional capability or performance levels of equipment required for safe operation of the facility. There is reasonable assurance that the Required Actions to be taken when the LCO is not met are adequate to protect the health and safety of the public. This meets the requirements of 10 CFR 50.36(c)(2)(i) and, therefore, the staff has determined that the licensee's proposed changes to LCO 3.3.5.3 are acceptable.

3.3 Staff Evaluation of TS 3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control"

The NRC staff reviewed the water sources that would be applicable to the proposed TS 3.5.2.

The proposed LCO 3.5.2 would state, in part,

> One low pressure ECCS injection/spray subsystem shall be OPERABLE.

"One low pressure ECCS injection/spray subsystem" would consist of either one CS subsystem or one LPCI subsystem. A CS subsystem consists of one motor-driven pump, piping, and valves to transfer water from the suppression pool or condensate storage tanks to the RPV. An LPCI subsystem consists of one motor-driven pump, piping, and valves to transfer water from the suppression pool to the RPV. Fermi 2 has a total of four CS pumps and four LPCI pumps as described in UFSAR Section 6.3.2, "System Design."

The ECCS pumps are high-capacity pumps, with flow rates of thousands of gpm. Most RPV penetration flow paths would have a drain rate on the order of tens or hundreds of gpm. The manual initiation/start of an ECCS pump would provide the necessary water source to counter these expected drain rates. The LPCI subsystem is considered to be operable to perform its safety function while it is aligned and operating for decay heat removal if it is capable of being manually realigned. Decay heat removal in Modes 4 and 5 is not affected by the proposed Fermi 2 TS change as the requirements on the number of shutdown cooling subsystems that must be operable to ensure adequate decay heat removal from the core are unchanged. These requirements can be found in the Fermi 2 TS 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown," TS 3.9.7, "Residual Heat Removal (RHR) - High Water Level," and TS 3.9.8, "Residual Heat Removal (RHR) - Low Water Level." These Fermi 2 decay heat removal requirements are similar to the STS and can be found in NUREG-1433 TS 3.4.9, "Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown," TS 3.9.8, "Residual Heat Removal (RHR) - High Water Level," and TS 3.9.9, "Residual Heat Removal (RHR) - Low Water Level." Based on these considerations, the NRC staff finds that the water sources provide reasonable assurance that the lowest functional capability required for safe operation is maintained and the safety limit is protected.

The proposed TS LCO 3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control," contains two parts. The first part states that drain time of RPV water inventory to the TAF shall be ≥ 36 hours, and the second part states that one low pressure ECCS injection/spray subsystem shall be operable. The proposed Applicability for TS 3.5.2 is Modes 4 and 5. The proposed LCO 3.5.2 note states:

A Low Pressure Coolant Injection (LPCI) subsystem may be considered OPERABLE during alignment and operation for decay heat removal, if capable of being manually realigned and not otherwise inoperable.

The NRC staff reviewed the proposed TS 3.5.2, focusing on how the proposed changes maintain or establish requirements to ensure that the fuel remains covered with water during potential drain events. The proposed TS 3.5.2 contains Conditions A through E, which are based on either required ECCS injection/spray subsystem operability or drain time.

The current TS LCO states that two low pressure ECCS injection/spray subsystems shall be operable, whereas the proposed LCO 3.5.2 states that only one low pressure ECCS injection/spray subsystem shall be operable. This change is reflected in Condition A. The change from two low pressure ECCS injection/spray subsystems to one low pressure ECCS injection/spray subsystem is because this redundancy is not required for the applicable modes. With one ECCS injection/spray subsystem and non-safety related injection sources, defense-in-depth will be maintained. This defense-in-depth measure is consistent with other events considered during shutdown with no additional single failure assumed. The drain time controls, in addition to the required ECCS injection/spray subsystem, provide reasonable assurance that an unexpected draining event can be prevented or mitigated before the RPV water level would be lowered to the TS Safety Limit 2.1.1.3.

The proposed Modes 4 and 5 Applicability of TS 3.5.2 is appropriate given that the TS requirements on ECCS in Modes 1, 2, and 3 will be unaffected.

The proposed Condition A states that if the required ECCS injection/spray subsystem is inoperable, it is to be restored to operable status within 4 hours.

The proposed Condition B states that if Condition A is not met, a method of water injection capable of operating without offsite electrical power shall be established immediately. The proposed Condition B provides adequate assurance of an available water source should Condition A not be met within the 4-hour completion time.

The proposed Condition C states that for a drain time < 36 hours and ≥ 8 hours, to (C.1) verify the secondary containment boundary is capable of being established in less than the drain time with a completion time of 4 hours, and (C.2) verify each secondary containment penetration flow path is capable of being isolated in less than the drain time with a completion time of 4 hours, and (C.3) verify one standby gas treatment subsystem is capable of being placed in operation in less than the drain time with a completion time of 4 hours. The proposed Condition C provides adequate protection should the Drain Time be < 36 hours and ≥ 8 hours because of the ability to establish secondary containment, isolate additional flow paths, and have the standby gas treatment subsystem capable of being placed in operation.

The proposed Condition D states that when drain time is < 8 hours to (D.1) immediately initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level > TAF for ≥ 36 hours, and (D.2) immediately initiate action to establish secondary containment boundary, and (D.3) immediately initiate action to isolate each secondary containment penetration flow path or verify it can be manually isolated from the control room, and (D.4) immediately initiate action to verify one standby gas treatment subsystem is capable of being placed in operation. Additionally, there is a note stating that required ECCS injection/spray subsystem or additional method of water injection shall be

capable of operating without offsite electrical power, which is similar to proposed Condition B. The current Fermi 2 TS Condition D (Required Action C.2 and associated Completion Time not met) is similar to proposed Condition D. The proposed Condition D provides adequate protection should the drain time be < 8 hours because of the requirement for the ability to establish an additional method of water injection (without offsite electrical power), establish secondary containment, isolate additional flow paths, and have the standby gas treatment subsystem capable of being placed in operation.

The proposed Condition E states that when the required action and associated completion time of Condition C or D is not met, or the drain time is < 1 hour, then immediately initiate action to restore drain time to ≥ 36 hours. The proposed Condition E is new, as it is not present in the current Fermi 2 TS. The proposed Condition E is acceptable, as it provides the necessary step to restore the drain time to ≥ 36 hours should the other conditions not be met, or if the drain time is < 1 hour.

The NRC staff evaluated the proposed changes to TS 3.5.2 and finds them acceptable based on the actions taken to mitigate the water level reaching the TS Safety Limit 2.1.1.3 with the water sources available and maintaining Drain Time ≥ 36 hours. The LCO correctly specifies the lowest functional capability or performance levels of equipment required for safe operation of the facility. There is reasonable assurance that the Required Actions to be taken when the LCO is not met can be conducted without endangering the health and safety of the public and, therefore, they are acceptable.

3.3.1 Staff Evaluation of Proposed TS 3.5.2 Surveillances Requirements

The proposed TS 3.5.2 SRs include verification of Drain Time, verification of water levels/volumes that support ECCS injection/spray subsystems, verification of water filled pipes to preclude water hammer events, voltage and bus alignment verification to the LPCI swing bus, verification of correct valve positions for the required ECCS injection/spray subsystem, operation of the ECCS injection/spray systems through the recirculation line, verification of valves credited for automatic isolation actuated to the isolation position, and verification that the required ECCS injection/spray subsystem actuated on a manual initiation signal. Each of the nine SRs are described below.

SR 3.5.2.1: The Drain Time would be determined or calculated, and required to be verified to be ≥ 36 hours in accordance with the SFCP. This SR would verify that the LCO for Drain Time is met. Numerous indications of changes in RPV level are available to the operator. The period of 36 hours is considered reasonable to identify and initiate action to mitigate draining of reactor coolant (normally three operator shifts). Changes in RPV level would necessitate recalculation of the Drain Time.

SR 3.5.2.2 (previously SR 3.5.2.1): The suppression pool water level (≥ -66 inches) for a required LPCI subsystem is required to be verified to ensure pump net positive suction head and vortex prevention is available for the injection subsystem required to be operable by the LCO. Indications are available either locally or in the control room regarding suppression pool water level. This SR would be required to be performed in accordance with the SFCP.

SR 3.5.2.3 (previously SR 3.5.2.2): The suppression pool water level (≥ -66 inches) or condensate storage tank water level (≥ 19 ft.) for a required CS subsystem is required to be verified to ensure pump net positive suction head and vortex prevention. Indications are

available either locally or in the control room regarding suppression pool water level. This SR would be required to be performed in accordance with the SFCP.

SR 3.5.2.4 (existing TS SR 3.5.2.3 is unchanged and is added here for SR completeness and not part of the TSTF-542 scope of changes): The SR to verify correct voltage and breaker alignment to the LPCI swing bus. The LPCI system injection valves, recirculation pump discharge valves, and LPCI cross-tie valve are powered from the LPCI swing bus, which must remain energized to support operability of any required LPCI subsystem. Therefore, verification of proper voltage and correct breaker alignment to the swing bus is made per the SFCP. The correct breaker alignment ensures that the appropriate electrical power sources are available, and the appropriate voltage is available to the swing bus, including verification that the swing bus is energized. The verification of proper voltage availability ensures that the required voltage is readily available for critical system loads connected to this bus. The Frequency takes into account the redundant capability of the AC, DC, and AC swing bus electrical power sources, and other indications available in the control room that alert the operator to subsystem malfunctions.

SR 3.5.2.5 (previously SR 3.5.2.4): The SR to verify that the ECCS injection/spray subsystem piping locations susceptible to gas accumulation (voiding and entrained air) are sufficiently filled with water would be retained from the existing TS 3.5.2. The proposed change would update the SR to reflect the change to LCO 3.5.2, which would require, in part, one low pressure ECCS injection/spray subsystem to be operable instead of two. Existing SR 3.5.2.4 wording would change from "Verify, for each required ECCS..." to "Verify, for the required ECCS..." This change would clarify the requirement to maintain consistency with the proposed LCO. Maintaining the pump discharge lines of the required ECCS injection/spray subsystem sufficiently full of water ensures that the ECCS subsystem will perform properly. This will also prevent water hammer following an ECCS initiation signal. One acceptable method of ensuring that the lines are full is to vent at the high points. This SR would be required to be performed in accordance with the SFCP.

SR 3.5.2.6 (previously SR 3.5.2.5): The SR to verify the correct alignment for manual, power operated, and automatic valves in the required ECCS subsystem flow path would be retained from the existing TS 3.5.2. Similar to the change discussed above for proposed SR 3.5.2.5, changes to SR 3.5.2.6 would clarify a proposed requirement for LCO 3.5.2. The proposed SR wording, "Verify, for the required ECCS injection/spray subsystem, each manual..." would replace "Verify each required ECCS injection/spray subsystem manual..." SR 3.5.2.6 would provide assurance that the proper flow path will be available for ECCS operation to support TS 3.5.2. This SR would be required to be performed in accordance with the SFCP. This SR would not apply to valves that are locked, sealed, or otherwise secured in position, since these valves would be verified to be in the correct position prior to locking, sealing, or securing.

This SR is modified by a note stating that it is not required to be met for system vent flow paths opened under administrative control. This note would require, under administrative control, a dedicated individual to rapidly close the system vent flow path, if directed.

The existing Note for SR 3.5.2.5 related to LPCI alignment from decay heat removal would be deleted and a similar note would be added to the beginning of LCO 3.5.2. This was previously described in Section 2.2.5.1 of this SE and is further evaluated in Section 3.5.1 (Variation 1).

SR 3.5.2.7: The required ECCS injection/spray subsystem would be required to be operated through its recirculation line for ≥ 10 minutes in accordance with the SFCP. This would demonstrate that the subsystem is capable of operation to support TS 3.5.2. Testing the ECCS injection/spray subsystem through the recirculation line is necessary to avoid overfilling the refueling cavity. The minimum operating time of 10 minutes is based on engineering judgement.

SR 3.5.2.8: Verification that each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated RPV water level isolation signal would be required to prevent RPV water inventory from dropping below the TS Safety Limit 2.1.1.3 should an unexpected draining event occur. This SR would be required to be performed in accordance with the SFCP.

SR 3.5.2.9 (previously SR 3.5.2.7): In Reference 3, DTE revised the SR as initially proposed in Reference 1. This SR would state, "Verify the required ECCS injection/spray subsystem can be manually operated." This SR verifies that manual initiation by means of individual component controls will cause the required CS subsystem or LPCI subsystem to start and operate as designed, including pump startup and actuation of all valves to their required positions. Vessel injection/spray may be excluded from the SR, per the existing Note. This SR would be required to be performed in accordance with the SFCP.

The NRC staff evaluated each of these proposed SRs associated with the proposed changes to LCO 3.5.2 and concluded that they are appropriate for ensuring the operability of the equipment and instrumentation specified in LCO 3.5.2. The staff concluded that each of the proposed SRs are acceptable since they meet the requirements of 10 CFR 50.36(c)(2)(ii) regarding insights gained via operating experience and 10 CFR 50.36(c)(3) for SRs by ensuring that the necessary quality of systems and components is maintained.

3.4 Staff Evaluation of TS Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation"

Fermi 2 TS LCO 3.3.5.1 currently states that, "The ECCS instrumentation for each Function in Table 3.3.5.1-1 shall be OPERABLE," with the applicability as stated in TS Table 3.3.5.1-1. TS Table 3.3.5.1-1, "Emergency Core Cooling System Instrumentation," contains requirements for function operability during Modes 4 and 5 when the associated ECCS subsystem(s) are required to be operable. Conforming changes were proposed for the Actions table of LCO 3.3.5.1 as well.

For the following Functions in Table 3.3.5.1-1, Mode 4 and 5 requirements would be deleted:

1. Core Spray System
   - (a) Reactor Vessel Water Level - Low Low Low, Level 1
   - (c) Reactor Steam Dome Pressure - Low (Injection Permissive)
   - (d) Manual Initiation

2. Low Pressure Coolant Injection (LPCI) System
   - (a) Reactor Vessel Water Level - Low Low Low, Level 1
   - (c) Reactor Steam Dome Pressure - Low (Injection Permissive)
   - (d) Reactor Vessel Water Level - Low Low, Level 2 (Loop Select Logic)
   - (e) Reactor Steam Dome Pressure - Low (Break Detection Logic)
   - (h) Manual Initiation

These Functions would be deleted to support the consolidation of RPV WIC instrumentation requirements into proposed new TS 3.3.5.3. The requirements for Functions 1.c, 1.d, 2.c, and 2.h would be moved to proposed TS Table 3.3.5.3-1 as discussed in Section 3.2.4.1 of this SE.

For TS Table 3.3.5.1-1 Functions 1.a, 2.a, 2.d, and 2.e, the Modes 4 and 5 requirements would not be retained. The Fermi 2 TSs currently require automatic initiation of ECCS pumps on low reactor vessel water level. However, in Modes 4 and 5, automatic initiation of ECCS pumps could result in overfilling the refueling cavity or water flowing into the main steam lines, potentially damaging plant equipment.

The NRC staff finds acceptable the deletion of TS Table 3.3.5.1-1, Functions 1.a and 2.a because manual ECCS initiation is preferred over automatic initiation during Modes 4 and 5, and the operator would be able to use other, more appropriately sized pumps if needed to mitigate a draining event.

The deletion of Functions 2.d and 2.e, regarding the LPCI loop select logic and break detection logic, are evaluated as Variation 3 in Section 3.5.3 of this SE.

3.5 Staff Evaluation of Proposed Technical Variations

DTE proposed the following technical variations from the TS changes described in TSTF-542 or the applicable parts of the NRC staff's SE for TSTF-542. The licensee stated in the LAR that these variations do not affect the applicability of TSTF-542 or the NRC staff's SE for TSTF-542 to the proposed license amendment. The NRC staff evaluated each variation below.

3.5.1 Variation 1, SR 3.5.2.5 note

Fermi 2 SR 3.5.2.5 contains Note 1 regarding realignment to the LPCI mode from the decay heat removal mode, which is similar to the proposed Note in STS LCO 3.5.2. DTE proposed to delete Note 1, which applies only to SR 3.5.2.5, and insert a similar note that will apply to the overall LCO for 3.5.2, to be consistent with the STS.

The NRC staff finds that adding the Note to LCO 3.5.2 associated with the LPCI subsystem is appropriate. Without the note, the associated RHR pump would be declared inoperable, which would be contrary to the intent of the current note for SR 3.5.2.5, which allows the LPCI subsystem to be OPERABLE when aligned for decay heat removal; therefore, the NRC staff finds Variation 1 acceptable.

3.5.2 Variation 2, CS and LPCI Pump Discharge Flow Low

The proposed Fermi 2 TS Table 3.3.5.3-1 does not include functions corresponding to STS Table 3.3.5.1-1, Function 1.d, "Core Spray Pump Discharge Flow - Low (Bypass)," and Function 2.g, "Low Pressure Coolant Injection Pump Discharge Flow - Low Bypass," since the Fermi TSs do not currently contain these functions in TS Table 3.3.5.1-1.

The licensee clarified the omission of these functions from proposed TS Table 3.3.5.3-1 by stating (Reference 2):

> The necessary alignments and component surveillances are accomplished through use of approved plant procedures and Operators that are trained on the use of these procedures. In Modes 4 or 5, alignment of either CS or LPCI from the normal standby system alignment consists of starting the associated CS or LPCI pump and opening of the injection valve. Both manipulations are performed from the main control room and guidance including the expected minimum flow valve response is provided in system operating procedures. Therefore, the corresponding automatic support functions are not proposed to be added to the Fermi 2 TS with the adoption of TSTF-542, consistent with these functions not being included in the current Fermi 2 TS.

The NRC staff finds that the manual operating procedures required to perform the manual initiation of CS and LPCI functions of TS 3.3.5.3 provide reasonable assurance that the pumps will operate as expected and that adequate pump protection will be provided; therefore, the NRC staff finds Variation 2 acceptable.

3.5.3 Variation 3, LPCI Loop Select Logic and Break Detection Logic

Fermi 2 TS Table 3.3.5.1-1, Function 2.d, "Reactor Vessel Water Level – Low Low, Level 2 (Loop Select Logic)," and Function 2.e, "Reactor Steam Dome Pressure – Low (Break Detection Logic)," are not included in the STS Table 3.3.5.1-1. Function 2.d and 2.e enable and initiate LPCI loop select logic. Loop select logic is initiated on decreasing RPV water level at Level 2. The logic then has time to detect a broken recirculation loop and select the unbroken recirculation loop for LPCI injection. TSTF- 542 states that if there are plant-specific design and TSs that provide different automatic functions that can be credited for isolating penetrations flow paths below the top of active fuel on low RPV water level, that those functions should be included in the RPV WIC instrumentation TS (DTE proposed TS 3.3.5.3 for Fermi 2). Function 2.d and 2.e are automatic functions for enabling LPCI loop select logic and are removed, consistent with the TSTF-542 justification.

The NRC staff reviewed this variation and determined that the current licensing basis from TS Table 3.3.5.1-1, Functions 2.d and 2.e, is related to the reactor coolant system breaks in Modes 1, 2, 3, 4, and 5. Modes 4 and 5 generally do not have the high pressure and temperature considered necessary for a LOCA envisioned from a high energy pipe failure. Thus, while the potential for the sudden loss of large volumes of water from a LOCA are not expected, operators monitor for BWR RPV water level decreases resulting from potentially significant or even unexpected drainage paths. These potential drainage paths in Modes 4 and 5 generally would require less water replacement capability to maintain water above the TAF. Therefore, the NRC staff finds Variation 3 acceptable.

3.5.4 Variation 4, CS and LPCI Individual Component Controls (Manual Initiation) and Proposed Revision to SR 3.5.2.9 (Manual Operation)

The NRC staff found that the licensee's use of the term "manual initiation channel" is inconsistent with the design assumptions in TSTF-542 and the STS in general. As a result, this section contains a discussion of the clarifications and revisions to the original LAR (refence 1) with regard to requirements for ECCS manual initiation.

The required channels for Fermi 2 TS Table 3.3.5.1-1, Function 1.d, "Manual Initiation" of the CS system, and 2.h, "Manual Initiation" of the LPCI system, are modified by a footnote stating, "Individual component controls." The footnote is retained for the manual initiation functions of the CS system and the LPCI system in the proposed TS Table 3.3.5.3-1 as footnote (c) consistent with the current Fermi 2 TS requirements.

In Reference 2, the licensee clarified the Fermi 2 "manual initiation" functions for its low pressure ECCS systems as follows:

> Fermi 2 does not have the capability to actuate an entire subsystem of CS or LPCI by a single manual pushbutton [as described in another part of reference 2.] Instead, a CS or LPCI subsystem is actuated by manually controlling each individual component of that subsystem in accordance with approved plant procedures. In this context, the phrase "manual initiation channel" in the proposed TS Bases page B 3.3.5.3-3 is used to collectively describe all of the individual components required to manually initiate a subsystem and is not intended to imply that pushing one or two buttons actuates an entire subsystem. Collectively referring to the individual component controls of a subsystem as a "manual initiation channel" in the proposed TS Bases page B 3.3.5.3-3 was done to maintain consistency with the previous usage of the phrase in the Fermi 2 TS Bases, such as shown on page B 3.3.5.1-10 included in the original LAR.

In Reference 3, DTE proposed to revise SR 3.5.2.9 to reflect the existing Fermi 2 ECCS "manual initiation" design. The proposed SR would require verification that the ECCS subsystem designated to support WIC can be manually operated. The proposed SR was revised to align with TS Table 3.3.5.3-1 footnote (c) which states that the manual initiation function of CS and LPCI is accomplished through individual component controls.

In Reference 4, DTE proposed to revise SR 3.3.5.3.3 from "Perform LOGIC SYSTEM FUNCTIONAL TEST" to "Perform CHANNEL FUNCTIONAL TEST," since the logic system functional test does not apply to the Fermi 2 ECCS manual initiation design. The purpose of the logic system functional test in TSTF-542 is to test manual actuation of an ECCS subsystem via a single push button. Therefore, the licensee proposed in Reference 4 to require a channel functional test for the ECCS component controls for manual operation, consistent with the current licensing basis found in TS 3.3.5.1 for the same functions.

In Reference 5, DTE proposed to revise TS LCO 3.3.5.3 Condition D, changing the 24-hour Completion Time to "Immediately" for restoration of an inoperable CS or LPCI Manual Initiation Function. Proposed Condition D would also be combined with the Condition E that was proposed in Reference 1.

The NRC staff reviewed Variation 4 and determined that the licensee's use of the term "manual initiation channel" is inconsistent with the design assumptions in TSTF-542 and the STS in general. Therefore, the NRC staff deems it appropriate for the licensee to clarify Fermi 2's existing ECCS design and alter the TSTF-542 template accordingly to maintain consistency throughout the TSs.

The licensee stated in Reference 2 that the Fermi 2 CS or LPCI subsystem is actuated by manually controlling each individual component of that subsystem in accordance with

approved plant procedures and Fermi 2 does not have the capability to actuate an entire subsystem of CS or LPCI by a single manual pushbutton. The licensee proposed SR 3.5.2.9 (in Reference 3) which states, "Verify the required ECCS injection/spray subsystem can be manually operated." The NRC staff finds that this proposed manual initiation description and supporting SR 3.5.2.9 is consistent with a plant design in which the ECCS subsystem is started with individual component controls and not with the start of an ECCS injection push button.

The licensee proposed (in Reference 4) to change SR 3.3.5.3.3 from "Perform LOGIC SYSTEM FUNCTIONAL TEST" to "Perform CHANNEL FUNCTIONAL TEST." This is acceptable since manual initiation occurs by means of individual component controls and there is no logic system functional test that can be performed. Additionally, SR 3.3.5.3.3 is consistent with the current requirements for CS and LPCI manual initiation found in TS 3.3.5.1.

The licensee proposed (in Reference 5) to combine the requirements in TSTF-542 LCO 3.3.5.2 Conditions D and E since, for Fermi 2, the loss of the instrumentation that supports the CS and LCPI manual initiation function would be an immediate loss of the ability to inject water into the RPV, thus the licensee's originally proposed 24-hour Completion Time for the Required Action of "Restore channel to OPERABLE status" would be non-conservative. According to TSTF-542, LCO 3.3.5.2, Condition D, it is assumed that if there was a loss of ECCS instrumentation function, ECCS injection in the RPV would still be achievable since individual ECCS subsystem pump and valve switches (RPV injection function) would still be available. Newly proposed Fermi 2 LCO 3.3.5.3 Condition D is an immediate action to declare the ECCS subsystem inoperable, since the Fermi 2 design for CS/LPCI manual initiation via individual component controls has no backup means for achieving this function.

Based on the above discussion, the NRC staff finds Variation 4 acceptable.

3.5.5 Variation 5, TS 3.6.1.3, Action F.1 (RHR/SDC Isolation)

Fermi 2 TS 3.6.1.3, Action F.1 differs slightly from STS 3.6.1.3, Action H.1.

Specifically, Fermi 2 TS 3.6.1.3, Condition F states:

> Required Action and associated Completion Time of Condition A, B, C, or D not met for RHR-SDC PCIV(s) required to be OPERABLE during MODE 4 or 5.

Fermi 2 TS 3.6.1.3, Required Action F.1 states:

> Initiate action to isolate RHR-Shutdown Cooling System.

STS 3.6.1.3 (pre-TSTF-542 changes) Condition H states:

> [Required Action and associated Completion Time of Condition A, B, C, D, or E not met for PCIV(s) required to be OPERABLE during MODE 4 or 5 or during operations with a potential for draining the reactor vessel (OPDRVs)]

STS 3.6.1.3 (pre-TSTF-542) Required Action H.1 states:

> Initiate action to suspend OPDRVs.

The NRC staff reviewed Variation 5 and determined that Fermi 2's TS 3.6.1.3 Required Action F.1 is one of the OPDRV-related phrases used in TS. Its deletion is consistent with TSTF-542, as evaluated in Section 3.6 of this SE, where the deleted OPDRVs terms are evaluated collectively. Therefore, the NRC staff finds Variation 5 acceptable.

3.5.6 Variation 6, Administrative Change to TS 3.6.4.2, "Secondary Containment Isolation Valves (SCIVs."

DTE proposes to add a closed parenthesis to the title of Fermi 2 TS 3.6.4.2, "Secondary Containment Isolation Valves (SCIVs)."

This is an administrative change and has no effect on the adoption of TSTF-542; therefore, the NRC staff finds Variation 6 acceptable.

3.6 Staff Evaluation of Proposed Deletion of Reference to OPDRVs

Section 2.2.4 of this SE lists the numerous OPDRV references proposed for deletion. The proposed changes would replace the existing specifications related to OPDRVs with revised specifications for RPV WIC. Specifically, the proposed changes would remove the following from the current Fermi 2 TS: the term "operations with a potential for draining the reactor vessel," the acronym "OPDRVs," and related concepts such as "RHR Shutdown Cooling System integrity maintained," and Required Actions to "suspend OPDRVs."

The term OPDRVs is not specifically defined in the TSs and historically has been subject to inconsistent application by licensees. The changes discussed in this SE are intended to resolve any ambiguity by creating a new RPV WIC TS with attendant equipment operability requirements, required actions, and SRs, and deleting references to OPDRVs throughout the TS.

The current Fermi 2 TSs contain instrumentation requirements related to OPDRVs in four TS; three of them, which have the OPDRVs phrases described above, and TS 3.3.5.1. The proposed TS 3.3.5.3 consolidates the instrumentation requirements into a single location to simplify the presentation and provides requirements consistent with TS 3.5.2. The remaining TSs with OPDRVs requirements are for primary/secondary containment, primary/secondary containment isolation valves, standby gas treatment system, control room habitability, and electrical sources. Each of these systems' requirements during OPDRVs were proposed for consolidation into the proposed new TS 3.5.2 for RPV WIC, based on the appropriate plant conditions and calculated Drain Time.

The NRC staff determined that the deletion of OPDRV references, along with the corresponding editorial changes, are appropriate because the proposed TSs governing RPV WIC and the associated instrumentation (TSs 3.5.2 and 3.3.5.3, respectively) are a simplified alternative set of controls for ensuring that water level is maintained above the TS Safety Limit 2.1.1.3 and, therefore, these changes are acceptable.

3.7 Staff Evaluation of TS 3.10, "Special Operations," and TSTF-484

The current Fermi 2 TS LCO 3.10.1, "Inservice Leak and Hydrostatic Testing Operation," allows temperature excursions greater than 200 °F, while in Mode 4, to allow performance of inservice leak and hydrostatic testing, as a consequence of maintaining adequate pressure for

an inservice leak and hydrostatic test, or as a consequence of maintaining adequate pressure for control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test.

TSTF-484, Revision 0, "Use of TS 3.10.1 for Scram Time Testing Activities," revised LCO 3.10.1 in the STS to expand its scope to include operations where temperature exceeds 200 °F: (1) as a consequence of maintaining adequate reactor pressure for an inservice leak or hydrostatic test, or (2) as a consequence of maintaining adequate reactor pressure for control rod scram time testing initiated in conjunction with an inservice leak or hydrostatic test.

By amendment No. 210, dated September 13, 2018 (Reference 11), the NRC approved changes to Fermi 2 TS LCO 3.10.1 to adopt the provisions of TSTF-484. The NRC staff's SE for this amendment stated, in part, that, "two ECCS injection/spray subsystem[s must] be operable in Mode 4" at Fermi 2 per TS 3.5.2. However, per the proposed revised LCO 3.5.2, only one low pressure ECCS injection/spray subsystem would be required to be operable in Mode 4

The NRC staff has determined that changing from two ECCS injection/spray subsystems to one ECCS injection/spray subsystem is acceptable because, as stated previously in Section 3.3 of this SE, this level of redundancy is not required, even during application of LCO 3.10.1.

The NRC staff's SE for Fermi 2 amendment No. 210 stated, in part:

> During inservice leak or hydrostatic testing in Mode 4, both pressure and temperature are elevated and leaks can develop. If a leak occurs during testing, it may be necessary to replenish inventory. Small leaks from the RCS would be detected by inspections before a significant loss of inventory occurs. In the event of a large RCS leak, the reactor pressure vessel would rapidly depressurize and allow operation of the low pressure emergency core cooling system (ECCS). The TS requires that two ECCS injection/spray trains be operable.
>
> Since the licensee applies LCO 3.10.1 at the end of a refueling outage, at low decay heat values, and near Mode 4 conditions, the stored energy in the reactor core will be very low. There is much more water in the reactor vessel than what is present during power operation and the reactor pressure vessel nearly water solid. Therefore, the operators would have time to respond with manual actions to start any ECCS pumps and properly align valves for injection from the control room. The capability of the low pressure ECCS would be adequate to maintain the fuel covered under the low decay heat conditions during these tests.

As stated previously in Section 3.3 of this SE, with one ECCS injection/spray subsystem and non-safety related injection sources, defense-in-depth will be maintained. The defense-in-depth measure is consistent with other events considered during shutdown with no additional single failure assumed. The drain time controls, in addition to the required ECCS injection/spray subsystem, provide reasonable assurance that an unexpected draining event can be prevented or mitigated before the RPV water level would be lowered to the TS Safety Limit 2.1.1.3.

After considering of the reasoning presented in this SE in Section 3.3 and reviewing Reference 11, the NRC staff determined that the Fermi 2 LCOs 3.3.5.3 and 3.5.2 adopted as part of TSTF-542 are satisfactory and will, therefore, be acceptable even during application of LCO 3.10.1.

3.8 Technical Conclusion

Fermi 2 TS Safety Limit 2.1.1.3 requires that reactor vessel water level shall be greater than the top of active irradiated fuel. Maintaining water level above the TAF ensures that the fuel cladding fission product barrier is protected during shutdown conditions. The proposed TS changes evaluated within this SE establish new LCO requirements that address the preventive and mitigate equipment and associated instrumentation that provide an alternative means to support TS Safety Limit 2.1.1.3 during Modes 4 and 5 operations.

The reactor coolant system is at a low operating temperature (< 200 °F) and is depressurized during Modes 4 and 5 conditions. An event involving a loss of inventory while in the shutdown condition does not exceed the capacity of one ECCS subsystem. The accidents that are postulated to occur during shutdown conditions (i.e., the Fuel Handling Accident (UFSAR Section 15.7.4) and the Hypothetical Liquid and Solid Radwaste System Accident Analysis (UFSAR 15.7.3)) do not involve a loss of inventory. Therefore, the equipment and instrumentation associated with the RPV WIC TSs do not provide detection or mitigation related to these design basis accidents.

The proposed TS LCO 3.5.2 contains requirements for operability of one ECCS subsystem along with requirements to maintain a sufficiently long Drain Time so that plant operators would have time to diagnose and mitigate an unplanned draining event. The NRC staff has determined that LCO 3.5.2 and LCO 3.3.5.3 provide for the lowest functional capability or performance levels of equipment required for safe operation of the facility and, therefore, meet the LCO requirements of 10 CFR 50.36(c)(2)(i).

Additionally, the revised TS LCOs 3.5.2 and 3.3.5.3 provide remedial actions to be taken in the event the LCO is not satisfied and, therefore, meet the requirements of 10 CFR 50.36(c)(2)(i).

The NRC staff finds that the proposed Action statements provide reasonable assurance that an unexpected draining event can be prevented or mitigated before the RPV water level would be lowered to the TAF.

The NRC staff evaluated the proposed Drain Time definition, TS 3.5.2 (which contains the requirements for RPV WIC), and TS 3.3.5.3 (which contains the requirements for instrumentation necessary to support TS 3.5.2). Based on the considerations discussed above, the NRC staff concludes that the proposed revisions are acceptable because they consolidate and clarify the RPV WIC requirements, which meet 10 CFR 50.36(c)(2)(ii), Criterion 4, to establish LCOs for structures, systems, or components significant to public health and safety as evidenced by operating experience.

The licensee proposed to delete OPDRV references from the TS Applicability, Conditions, Required Actions, and Notes. The NRC staff reviewed the proposed changes and determined that the deletion of OPDRV references, along with the corresponding editorial changes, are appropriate because the proposed TSs governing RPV WIC and the associated

instrumentation, TSs 3.5.2 and 3.3.5.3, respectively, are a clarified and simplified alternative set of controls for ensuring that water level is maintained above the TAF.

The NRC staff reviewed the SRs associated with the revised TS LCO 3.5.2 and new LCO 3.3.5.3. The NRC staff finds that the proposed SRs is TS 3.5.2 are acceptable since they support TS 3.5.2 drain time requirements, assure that water inventory is available for ECCS injection/spray subsystem RPV injection and pump performance, ECCS injection/spray subsystems are adequately filled (mitigates effects of gas accumulation or voiding), the subsystems have verified valve positions to support RPV injection, verify correct voltage and breaker alignment to the LPCI swing bus, verify that pumps provide adequate flow to support drain time and RPV injection, verification of automatic isolation, and ECCS injection/spray subsystems can be manually operated (manual initiation by means of individual component controls). The NRC staff finds that the three SRs proposed for TS 3.3.5.3 are sufficient and adequate, because they ensure that the Functions are capable of performing their specified safety functions in support of TS 3.5.2, Drain Time, and the protection from a potential drain down of the RPV in Modes 4 and 5. Therefore, the NRC staff concludes that the proposed SRs satisfy 10 CFR 50.36(c)(3).

The NRC staff evaluated the proposed Fermi 2 changes against each of the unit applicable design requirements listed in Section 2.3.1 of this SE. The NRC staff finds that the proposed changes for Mode 4 and 5 operations, as they relate to the proposed TS changes for the new drain time definition and the removal of OPDRV references, remain consistent with the Appendix A to 10 CFR Part 50, "General Design Criteria for Nuclear Power Plants," in that the Fermi 2 design requirements for instrumentation, reactor coolant leakage detection, the reactor coolant pressure boundary, and reactor coolant makeup are unaffected.

The regulation at 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. Consistent with 10 CFR 50.36(a)(1), the licensee submitted corresponding TS Bases changes that provide the reasons for the proposed TSs changes. The NRC staff concludes that the TS Bases changes provided describe the bases for the affected TSs and follow the "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" (58 FR 39132).

Additionally, the proposed TS changes were reviewed for technical clarity and consistency with the existing Fermi 2 requirements for customary terminology and formatting. The NRC staff found that the proposed changes were consistent with TSTF-542, Revision 2 (Reference 6) and Chapter 16 of the SRP (Reference 8).

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Michigan State official was notified of the proposed issuance of the amendment on September 6, 2018. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes 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, published in the *Federal Register* on November 7, 2017 (82 FR 51649), 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.

7.0 REFERENCES

1. Letter from DTE Energy (DTE) to US NRC, "Application to Revise Technical Specifications to Adopt TSTF-542, Reactor Pressure Vessel Water Inventory Control," dated August 31, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17243A422).

2. Letter from DTE Energy (DTE) to US NRC, "Response to NRC Request for Additional Information for License Amendment Request to Adopt TSTF-542, Reactor Pressure Vessel Water Inventory Control," dated April 4, 2018 (ADAMS Accession No. ML18094A165).

3. Letter from DTE Energy (DTE) to US NRC, "Response to NRC Request for Additional Information for License Amendment Request to Adopt TSTF-542, Reactor Pressure Vessel Water Inventory Control," dated May 17, 2018 (ADAMS Accession No. ML18138A149).

4. Letter from DTE Energy (DTE) to US NRC, "Supplemental Information in Response to NRC Request for Additional Information for License Amendment Request to Adopt TSTF-542, Reactor Pressure Vessel Water Inventory Control," dated June 27, 2018 (ADAMS Accession No. ML18178A134).

5. Letter from DTE Energy (DTE) to US NRC, "Response to NRC Request for Additional Information for License Amendment Request to Adopt TSTF-542, Reactor Pressure Vessel Water Inventory Control," dated August 7, 2018 (ADAMS Accession No. ML18219A659).

6. Enclosure to Technical Specifications Task Force Traveler TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control," dated March 14, 2016 (ADAMS Accession No. ML16074A448).

7. Final Safety Evaluation of Technical Specifications Task Force Traveler TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control" (TAC NO. MF3487), dated December 20, 2016 (ADAMS Accession No. ML16343B008).

8. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition (NUREG-0800, formerly issued as NUREG-75/087)," Chapter 16.0. "Technical Specifications," Revision 3, dated March 2010 (ADAMS Accession No. ML100351425).

9. NUREG-1433, "Standard Technical Specifications, General Electric BWR/4 Plants," Vol. 1, "Specifications," Rev. 4.0, dated April 2012 (ADAMS Accession No. ML12104A192).

10. NUREG-1433, "Standard Technical Specifications, General Electric, BWR/4, Revision. 4.0, Vol. 2, Bases," dated April 2012 (ADAMS Accession No. ML12104A193).

11. Letter from US NRC to DTE Energy, "Fermi 2 - Issuance of Amendment Regarding the Adoption of Technical Specification Task Force Traveler TSTF-484, Use of TS 3.10.1 for Scram Time Testing Activities, (EPID L-2017-LLA-0351)" dated September 13, 2018 (ADAMS Accession No. ML18165A202).

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