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

July 16, 2019

Ms. Cheryl A. Gayheart
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
3535 Colonnade Parkway
Birmingham, AL 35243

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS RE: REVISE TECHNICAL SPECIFICATION REQUIREMENTS DURING HANDLING IRRADIATED FUEL AND CORE ALTERATIONS TSTF-51 AND TSTF-471 (EPID L-2018-LLA-0486 AND L-2018-LLA-0487)

Dear Ms. Gayheart:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 223 to Renewed Facility Operating License No. NPF-2 and Amendment No. 220 to Renewed Facility Operating License No. NPF-8 for the Joseph M. Farley Nuclear Plant (Farley), Units 1 and 2, respectively. The amendments are in response to your application dated November 29, 2018.

The amendments change Technical Specifications (TSs) by:

1. Revising certain TSs to remove the requirements for engineered safety feature systems to be operable after sufficient radioactive decay of irradiated fuel has occurred following a plant shutdown;

2. Revising certain TSs actions that are not needed to mitigate accidents postulated during shutdown;

3. Revising the licensing basis for the Fuel Handling Accident (FHA) analysis;

4. Partially adopt Standard Technical Specifications (STS) Change Traveler Technical Specifications Task Force (TSTF) - 51, "Revise containment requirements during handling irradiated fuel and core alterations," Revision 2; and,

5. Partially adopt STS Change Traveler TSTF- 471, "Eliminate use of term CORE ALTERATIONS in ACTIONS and Notes" Revision 1.

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

Sincerely,

Shawn Williams

Shawn A. Williams, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-348 and 50-364

Enclosures:
1. Amendment No. 223 to NPF-2
2. Amendment No. 220 to NPF-8
3. Safety Evaluation

cc: Listserv

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

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

ALABAMA POWER COMPANY

DOCKET NO. 50-348

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 223
Renewed License No. NPF-2

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

   A. The application for amendment to the Joseph M. Farley Nuclear Plant, Unit 1, (the facility), Renewed Facility Operating License No. NPF-2, filed by Southern Nuclear Operating Company, Inc. (the licensee), dated November 29, 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 license 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-2 is hereby amended to read as follows:

   2.C.(2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 223, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: July 16, 2019

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

SOUTHERN NUCLEAR OPERATING COMPANY

ALABAMA POWER COMPANY

DOCKET NO. 50-364

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 220
Renewed License No. NPF-8

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

   A. The application for amendment to the Joseph M. Farley Nuclear Plant, Unit 2, (the facility), Renewed Facility Operating License No. NPF-8, filed by Southern Nuclear Operating Company, Inc. (the licensee), dated November 29, 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 license 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-8 is hereby amended to read as follows:

   2.C.(2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 220, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: July 16, 2019

ATTACHMENT TO JOSEPH M. FARLEY NUCLEAR PLANTS

UNITS 1 AND 2

LICENSE AMENDMENT NO. 223

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-2

DOCKET NO. 50-348

AND LICENSE AMENDMENT NO. 220

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-8

DOCKET NO. 50-364

Replace the following pages of the Renewed Facility Operating Licenses and Appendix "A" Technical Specifications (TSs) with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
License	License
NPF-2, page 4	NPF-2, page 4
NPF-8, page 3	NPF-8, page 3
TSs	TSs
3.3.6-2	3.3.6-2
3.3.6-5	3.3.6-5
3.3.8-2	3.3.8-2
3.3.8-5	3.3.8-5
3.7.12-1	3.7.12-1
3.7.12-2	3.7.12-2
3.9.1-1	3.9.1-1
3.9.2-1	3.9.2-1
3.9.3-1	3.9.3-1

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 223, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

(3) Additional Conditions

The matters specified in the following conditions shall be completed to the satisfaction of the Commission within the stated time periods following the issuance of the renewed license or within the operational restrictions indicated. The removal of these conditions shall be made by an amendment to the renewed license supported by a favorable evaluation by the Commission.

a. Southern Nuclear shall not operate the reactor in Operational Modes 1 and 2 with less than three reactor coolant pumps in operation.

b. Deleted per Amendment 13

c. Deleted per Amendment 2

d. Deleted per Amendment 2

e. Deleted per Amendment 152

Deleted per Amendment 2

f. Deleted per Amendment 158

g. Southern Nuclear shall maintain a secondary water chemistry monitoring program to inhibit steam generator tube degradation. This program shall include:

1) Identification of a sampling schedule for the critical parameters and control points for these parameters;

2) Identification of the procedures used to quantify parameters that are critical to control points;

3) Identification of process sampling points;

4) A procedure for the recording and management of data;

5) Procedures defining corrective actions for off control point chemistry conditions; and

(2) Alabama Power Company, pursuant to Section 103 of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess but not operate the facility at the designated location in Houston County, Alabama in accordance with the procedures and limitations set forth in this renewed license.

(3) Southern Nuclear, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(4) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(6) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Southern Nuclear is authorized to operate the facility at reactor core power levels not in excess of 2775 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 220, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

(3) Deleted per Amendment 144
(4) Deleted per Amendment 149
(5) Deleted per Amendment 144

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ----------NOTE---------- Only applicable during movement of recently irradiated fuel assemblies within containment. ---------- One or more manual channel(s) inoperable. <u>OR</u> Two radiation monitoring channels inoperable. <u>OR</u> Required Action and associated Completion Time for Condition A not met.	C.1 Place and maintain containment purge and exhaust valves in closed position. <u>OR</u> C.2 Enter applicable Conditions and Required Actions of LCO 3.9.3, "Containment Penetrations," for containment purge and exhaust isolation valves made inoperable by isolation instrumentation.	Immediately Immediately

Table 3.3.6-1 (page 1 of 1)
Containment Purge and Exhaust Isolation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	1,2,3,4 (a)	2	SR 3.3.6.6	NA
2.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	SR 3.3.6.2 SR 3.3.6.3 SR 3.3.6.5 SR 3.3.6.8	NA
3.	Containment Radiation Gaseous (R-24A, B)	1,2,3,4 (a)	1 2	SR 3.3.6.1 SR 3.3.6.4 SR 3.3.6.7	$\leq 2.27 \times 10^{-2}$ µCi/cc (b)(c) $\leq 4.54 \times 10^{-3}$ µCi/cc (b)(d) $\leq 2.27 \times 10^{-3}$ µCi/cc (b)(e)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a., for all initiation functions and requirements.			

(a) During movement of recently irradiated fuel assemblies within containment.
(b) Above background with no flow.
(c) With mini-purge in operation.
(d) With slow speed main purge in operation.
(e) With fast speed main purge in operation.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ----------NOTE---------- Only applicable to Functions required OPERABLE by Table 3.3.8-1 during movement of recently irradiated fuel assemblies in the spent fuel pool room. ---------- Required Action and associated Completion Time for Condition A or B not met during movement of recently irradiated fuel assemblies in the spent fuel pool room.	C.1 Suspend movement of recently irradiated fuel assemblies in the spent fuel pool room.	Immediately
D. ----------NOTE---------- Only applicable to Functions required OPERABLE by Table 3.3.8-1 in MODES 1-4. ---------- Required Action and associated Completion Time for Condition A or B not met in MODE 1, 2, 3, or 4.	D.1 Be in MODE 3. AND D.2 Be in MODE 5.	6 hours 36 hours

Table 3.3.8-1 (page 1 of 1)
PRF Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	1,2,3,4, (a)	2 trains	SR 3.3.8.6	NA
2.	Automatic Actuation Logic and Actuation Relays	1,2,3,4	2 trains	SR 3.3.8.3 SR 3.3.8.4 SR 3.3.8.5	NA
3.	Spent Fuel Pool Room Radiation Gaseous (R-25A, B)	(a)	2	SR 3.3.8.1 SR 3.3.8.2 SR 3.3.8.7	$\leq 8.73 \times 10^{-3}$ µCi/cc (b)
4.	Spent Fuel Pool Room Ventilation Differential Pressure (PDSL-3989A and B)	(a)	2	SR 3.3.8.6 SR 3.3.8.7	NA
5.	Containment Isolation - Phase B	Refer to LCO 3.3.2, "ESFAS Instrumentation" Function 3.b, for all initiation Functions and requirements.			

(a) During movement of recently irradiated fuel assemblies in the spent fuel pool room.
(b) Above background with no flow.

3.7 PLANT SYSTEMS

3.7.12 Penetration Room Filtration (PRF) System

LCO 3.7.12 Two PRF trains shall be OPERABLE.

---------- NOTE ----------
The PRF and Spent Fuel Pool Room (SFPR) boundaries may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, and 4 for post LOCA mode of operation,
During movement of recently irradiated fuel assemblies in the SFPR for the fuel handling accident mode of operation.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One PRF train inoperable.	A.1	Restore PRF train to OPERABLE status.	7 days
B. Two PRF trains inoperable in MODE 1, 2, 3, or 4 due to inoperable PRF boundary.	B.1	Restore PRF boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4. OR Two PRF trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	C.1 AND C.2	Be in MODE 3. ----------NOTE---------- LCO 3.0.4.a is not applicable when entering MODE 4. ---------- Be in MODE 4.	6 hours 12 hours
D. Required Action and associated Completion Time of Condition A not met during movement of recently irradiated fuel assemblies in the SFPR.	D.1 OR D.2	Place OPERABLE PRF train in operation. Suspend movement of recently irradiated fuel assemblies in the SFPR.	Immediately Immediately

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two PRF trains inoperable during movement of recently irradiated fuel assemblies in the SFPR.	E.1 Suspend movement of recently irradiated fuel assemblies in the SFPR.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	----------NOTE---------- Only required to be met during movement of recently irradiated fuel assemblies in the SFPR. ---------- Verify two PRF trains aligned to the SFPR.	In accordance with the Surveillance Frequency Control Program
SR 3.7.12.2	Operate each PRF train for ≥ 15 minutes in the applicable mode of operation (post LOCA and/or refueling accident).	In accordance with the Surveillance Frequency Control Program
SR 3.7.12.3	Perform required PRF filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.12.4	Verify each PRF train actuates and the normal spent fuel pool room ventilation system isolates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.12.5	Verify one PRF train can maintain a pressure ≤ -0.125 inches water gauge with respect to adjacent areas during the post LOCA mode of operation at a flow rate ≤ 5500 cfm.	In accordance with the Surveillance Frequency Control Program
SR 3.7.12.6	Verify one PRF train can maintain a slightly negative pressure with respect to adjacent areas during the fuel handling accident mode of operation at a flow rate ≤ 5500 cfm.	In accordance with the Surveillance Frequency Control Program

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentrations of the Reactor Coolant System, the refueling canal, and the refueling cavity shall be maintained within the limit specified in the COLR.

APPLICABILITY: MODE 6.

---NOTE---
Only applicable to the refueling canal and refueling cavity when connected to the RCS.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Boron concentration not within limit.	A.1	Suspend positive reactivity additions.	Immediately
	AND		
	A.2	Initiate action to restore boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify boron concentration is within the limit specified in COLR.	In accordance with the Surveillance Frequency Control Program

3.9 REFUELING OPERATIONS

3.9.2 Nuclear Instrumentation

LCO 3.9.2 Two source range neutron flux monitors and one channel of audible count rate shall be OPERABLE.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required source range neutron flux monitor inoperable.	A.1	----------NOTE---------- CORE ALTERATIONS may continue to restore an inoperable source range neutron flux monitor. ---------- Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2	Suspend positive reactivity additions.	Immediately
B. Two required source range neutron flux monitors inoperable.	B.1	Initiate action to restore one source range neutron flux monitor to OPERABLE status.	Immediately
	AND		
	B.2	Perform SR 3.9.1.1.	Once per 12 hours
C. No audible count rate.	C.1.	Initiate action to isolate unborated water sources.	Immediately

3.9 REFUELING OPERATIONS

3.9.3 Containment Penetrations

LCO 3.9.3 The containment penetrations shall be in the following status:

a. The equipment hatch is capable of being closed and held in place by four bolts;

b. One door in each air lock is capable of being closed; and

c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:

1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or

2. capable of being closed by an OPERABLE Containment Purge and Exhaust Isolation System.

---NOTE---
Penetration flow path(s) providing direct access from the containment atmosphere to the outside atmosphere may be unisolated under administrative control.

APPLICABILITY: During movement of recently irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend movement of recently irradiated fuel assemblies within containment.	Immediately

UNITED STATES
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WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 223 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-2

AND

AMENDMENT NO. 220 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-8

SOUTHERN NUCLEAR OPERATING COMPANY

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-348 AND 50-364

1.0 INTRODUCTION

By application dated November 29, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18333A350) Southern Nuclear Operating Company, Inc. (SNC, the licensee) submitted a request to change the Joseph M. Farley Nuclear Plant, Units 1 and 2 (Farley), Technical Specifications (TSs).

The proposed amendment would revise TSs to remove the requirements for containment, containment purge and exhaust isolation radiation instrumentation, penetration room filtration (PRF) system, and associated PRF system actuation instrumentation associated with the spent fuel pool (SFP) room to be operable after sufficient radioactive decay of irradiated fuel has occurred following a plant shutdown. The proposed amendment also deletes the requirement to immediately suspend core alterations when boron concentration is not within the required limit during refueling and adds a Note to permit fuel assemblies, sources, and reactivity control components to be moved if necessary to restore operability of a required inoperable source range neutron flux monitor during refueling. The licensee requested to partially adopt Technical Specifications Task Force (TSTF) traveler TSTF-51, "Revise containment requirements during handling irradiated fuel and core alterations," Revision 2 (ADAMS Accession No. ML040400343) and TSTF-471, "Eliminate use of term CORE ALTERATIONS in ACTIONS and Notes," Revision 1 (ADAMS Accession No. ML19101A215).

To support this proposed amendment, the licensee requested a licensing basis change to the Farley fuel handling accident (FHA) analysis. The proposed revised FHA analysis would reduce the fuel decay period following plant shutdown and eliminate the reliance on auxiliary building closure and PRF system filtration for containment and filtration of radioactivity during an FHA. Additionally, the main control room timing would be increased to allow margin for radiation monitoring instrumentation response timing.

2.0 REGULATORY EVALUATION

2.1 System Description

In its letter dated November 29, 2018, the licensee stated, in part, that:

> During refueling operations, the containment serves to contain fission product radioactivity that may be released from the reactor core following an accident (i.e., FHA), such that off-site and MCR [Main Control Room] radiation exposures are maintained within the requirements 10 CFR 50.67.
>
> Containment purge and exhaust isolation instrumentation closes the containment isolation valves in the mini purge and main purge systems. This action isolates the containment atmosphere from the environment to minimize releases of radioactivity in the event of an accident.
>
> Two radiation monitoring channels are provided as input to the containment purge and exhaust isolation. The two channels measure radiation in the containment purge exhaust. Both detectors will respond to events that release radioactivity to containment, including an FHA during refueling. A high radiation signal from either detector initiates containment purge isolation, which closes containment isolation valves in the mini purge and main purge systems.
>
> The PRF system filters airborne radioactive particulates from the area of the fuel pool following an FHA. The system initiates filtered ventilation of the SFP room following receipt of a high radiation signal or a low air flow signal from the normal ventilation system. The system initiates filtered ventilation of the ECCS pump rooms and penetration area following receipt of a containment isolation actuation signal and manual isolation of the SFP room.

2.2 Licensee Proposed TS Changes

The proposed changes would change the TSs applicability of the containment purge and exhaust isolation instrumentation, the PRF actuation instrumentation, the PRF system, and the containment penetrations such that they are no longer required to be operable when moving irradiated fuel assemblies within containment but are required when moving recently irradiated fuel assemblies within containment. The proposed changes would allow core alterations to continue when boron concentration within the reactor coolant system, refueling canal, and reactor cavity is not within its limit and when the containment purge and exhaust isolation instrumentation is inoperable.

2.2.1 Revision to TS 3.3.6, Table 3.3.6-1

Current TS 3.3.6, Table 3.3.6-1, "Applicable Modes or Other Specified Conditions" for Functions 1. Manual Initiation and 3. Containment Radiation Gaseous (R-24A, B) are Modes 1, 2, 3, 4, (a), (b).

Current Notes (a) and (b) state:

(a) During CORE ALTERATIONS.
(b) During movement of irradiated fuel assemblies within containment.

The licensee proposed the following changes:

In Table 3.3.6-1, the "Applicable Modes or Other Specified Conditions" for the functions Manual Initiation and Containment Radiation Gaseous (R-24A, B) to be Modes 1, 2, 3, 4. The specified condition (a) "During CORE ALTERATIONS" is deleted, specified condition (b) is re-lettered to (a), and the word *recently* is added. Proposed new Note (a) states:

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

The remaining Notes in TS table 3.3.6-1 are re-lettered from (c), (d), (e), and (f) to (b), (c), (d), and (e), respectively. All the Notes referenced in TS Table 3.3.6-1 are revised to reflect the re-lettering.

Current Note in TS 3.3.6, Condition C, is revised from:

"Only applicable during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment."

to:

"Only applicable during movement of recently irradiated fuel assemblies within containment."

2.2.2 Revision to TS 3.3.8

The current TS 3.3.8, Table 3.3.8-1, "PRF Actuation Instrumentation," Note (a) states:

(a) During movement of irradiated fuel assemblies in spent fuel pool room.

The licensee proposed to add the word "recently", as shown below:

(a) During movement of recently irradiated fuel assemblies in the spent fuel pool room.

Consistent with this proposed change, the licensee proposed to change TS 3.3.8, Condition C and Required Action C.1, to also add the word "recently" before "irradiated fuel assemblies in the spent fuel pool room."

2.2.3 Revision to TS 3.7.12

Current TS 3.7.12, "Penetration Room Filtration (PRF) System," is applicable in Modes 1, 2, 3, and 4 for post LOCA [loss of coolant accident] mode of operation, and during movement of irradiated fuel assemblies in the SFPR [spent fuel pool room] for the fuel handling accident [FHA] mode of operation.

The licensee proposed to revise the applicability by adding the word *recently*, as shown below:

...During movement of recently irradiated fuel assemblies...

TS 3.7.12 Condition and Required Actions D and E are revised to reflect this change.

In addition, the licensee proposed to revise surveillance requirement (SR) 3.7.12.1 Note, in part, from:

> Only required to be performed during movement of irradiated fuel assemblies in the SFPR.

to:

> Only required to be met during movement of recently irradiated fuel assemblies in the SFPR.

2.2.4 Revision to TS 3.9.1

Current TS 3.9.1, "Boron Concentration," requires suspending core alterations if the boron concentration is not within its limits.

The licensee proposed to revise TS 3.9.1, Required Action, by deleting Required Action A.1, "Suspend CORE ALTERATIONS," and re-numbering Required Actions A.2 and A.3 to A.1 and A.2, respectively.

2.2.5 Revision to TS 3.9.2

Current TS 3.9.2, "Nuclear Instrumentation," requires two source range neutron flux monitors to be operable during Mode 6 [refueling].

The licensee proposed to revise TS 3.9.2, Conditions A and B by adding the word "required" to Conditions A and B. Proposed Condition A would state:

> One required source range neutron flux monitor inoperable.

Proposed Condition B would state:

> Two required source range neutron flux monitors inoperable.

In addition, the licensee proposed to revise Required Action A.1 by adding a Note that states, "CORE ALTERATIONS may continue to restore an inoperable source range neutron flux monitor."

2.2.6 Revision to TS 3.9.3

Current applicability for TS 3.9.3, "Containment Penetrations," states:

> During CORE ALTERATIONS,
> During movement of irradiated fuel assemblies within containment.

The licensee proposed to revise the applicability by adding the word "recently" and deleting "During CORE ALTERATIONS," as follows:

> During movement of recently irradiated fuel assemblies within containment.

The TS 3.9.3 Required Action would be revised, to delete Required Action A.1, "Suspend CORE ALTERATIONS," renumber Required Action A.2 to be A.1 and add "recently" to be consistent with the revised Applicability.

2.3 Applicable Regulatory Requirements and Guidance

The regulatory requirements and guidance on which the U. S. Nuclear Regulatory Commission (NRC) staff based its acceptance are:

10 CFR 50.67, "Accident source term," paragraph (b)(2), states:

> (2) The NRC may issue the amendment only if the applicant's analysis demonstrates with reasonable assurance that:
>
> (i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 rem)[2] total effective dose equivalent (TEDE).
>
> (ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 rem) total effective dose equivalent (TEDE).
>
> (iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) total effective dose equivalent (TEDE) for the duration of the accident.
>
> [2] The use of 0.25 Sv (25 rem) TEDE is not intended to imply that this value constitutes an acceptable limit for emergency doses to the public under accident conditions. Rather, this 0.25 Sv (25 rem) TEDE value has been stated in this section as a reference value, which can be used in the evaluation of proposed design basis changes with respect to potential reactor accidents of exceedingly low probability of occurrence and low risk of public exposure to radiation.

10 CFR 50, Appendix A, General Design Criteria (GDC) Criterion 19, Control Room. GDC 19 states, in part:

> A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident. Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary

instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.

Regulatory Guide (RG) 1.183, Revision 0, "Alternative Radiological Source Terms for Evaluating Design-Basis Accidents at Nuclear Power Reactors," published July 2000 (ADAMS Accession No. ML003716792), Section 4.4. The licensee has not proposed any significant deviation or departure from the guidance provided in RG 1.183.

10 CFR 50.36, "Technical Specifications." The regulation at 10 CFR 50.36(b) states, in part, "the technical specifications will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to 10 CFR 50.34." The categories of items required to be in the TSs are provided in 10 CFR 50.36(c). As required by 10 CFR 50.36(c)(2)(i), the TSs will include limiting conditions for operation (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 a 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)(3) requires TSs to include items in the category of surveillance requirements (SRs), which are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met. Also, 10 CFR 50.36(a)(1) states that a summary statement of the bases or reasons for such specifications, other than those covering administrative controls, shall also be included in the application, but shall not become part of the TSs. Accordingly, along with the proposed TSs changes, the licensee also submitted TSs Bases changes that correspond to the proposed TSs changes for information only.

NUREG-0800, Revision 0, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," July 2000, Table 1 Section 15.0.1, Radiological Consequence Analyses Using Alternative Source Terms (ADAMS Accession No. ML003734190).

NUREG-0800, Revision 3, Section 16, Technical Specifications, March 2010 (ADAMS Accession No. ML100351425) provide NRC staff guidance for the review of TSs.

TSTF-51, "Revise containment requirements during handling irradiated fuel and core alterations," Revision 2 (ADAMS Accession No. ML040400343). The NRC staff approved TSTF-51 in letter dated November 1, 1999 (ADAMS Accession No. ML993190284).

TSTF-471, "Eliminate use of term CORE ALTERATIONS in ACTIONS and Notes," Revision 1 (ADAMS Accession No. ML19101A215). The NRC staff approved TSTF-471 in letter dated December 7, 2006 (ADAMS Accession No. ML062860320).

NRC letter to Technical Specifications Task Force, "Plant-Specific Adoption of Travelers TSTF-51, Revision 2, "Revise Containment Requirements During Handling Irradiated Fuel and Core Alterations," TSTF-471, Revision 1, "Eliminate Use of Term Core Alterations in Actions and Notes," and TSTF-286, Revision 2, "Operations Involving Positive Reactivity Additions," October 4, 2018 (ADAMS Accession No. ML17346A587).

3.0 TECHNICAL EVALUATION

3.1 Radiation Protection and Consequence Review

The NRC staff's review focused on independently confirming the changes meet the NRC regulations and guidance regarding radiological dose consequences and ensuring any variations from the NRC-approved Travelers TSTF-51 and TSTF-471 are acceptable.

As described in the Reviewer's Note incorporated by TSTF-51 into the Standard Technical Specifications, information is to be provided by the licensee describing the evaluation of recently irradiated fuel demonstrating that after sufficient radioactive decay has occurred (from the time of shutdown) the radiological doses resulting from an FHA remain below the regulatory limits specified in GDC 19, and well within the offsite radiation dose values specified in 10 CFR 50.67, without crediting the systems not required to be operable. The safety evaluation in Section 3.1.1 below describes the licensee's radiological analysis assumptions, inputs, and methods for an FHA involving recently irradiated fuel. Section 3.1.2 discusses the impact of the proposed changes on the licensee's analysis of dropping of a heavy load onto irradiated fuel assemblies and Section 3.1.3 describes the removal of the defined term "core alterations" from the applicability section of the proposed TSs.

3.1.1 Evaluation of Recently Irradiated Fuel

The FHA involves the drop of a fuel assembly during refueling operations. The mechanical part of the licensee's analysis remains unchanged from the current licensing basis which assumes that the total number of failed fuel rods is 264 which is one fuel assembly out of the 157 fuel assemblies in the core. The depth of water over the damaged fuel is not less than 23 feet and is controlled by TS 3.7.13 and TS 3.9.6. Following reactor shutdown, decay of short-lived fission products greatly reduces the fission product inventory present in irradiated fuel. The radiological consequences analysis credits normal decay of irradiated fuel.

The FHA analysis was performed assuming a decay period of 70 hours after shutdown. The current licensing basis FHA analyzed four cases:

1. FHA in containment with the equipment hatch and the personnel airlock open.
2. FHA in containment with the personnel airlock open and the equipment hatch closed.
3. FHA in containment with the personnel airlock closed and the equipment hatch open.
4. FHA in the SFP with exhaust through the SPF area exhaust system.

An FHA in the SFP area of the auxiliary building would involve a release via the plant vent stack. An FHA in the containment would involve two release paths, one through the open equipment hatch directly to the environment, and one through the open personnel airlock to the auxiliary building and then to the environment via the plant vent stack. The licensee stated that the plant vent stack continues to be the most conservative source location for use in calculating the radiological consequences to personnel in the main control room following a design basis FHA. The licensee did not propose any changes to the atmospheric dispersion factors stated in the current licensing design basis accident analyses.

3.1.1.1 Source Term

The fission product inventory that constitutes the source term for this event is the gap activity in the fuel rods assumed to be damaged as a result of the postulated design basis FHA. Volatile

constituents of the core fission product inventory migrate from the fuel pellets to the gap between the pellets and the fuel rod cladding during normal power operations. The fission product inventory in the fuel rod gap of the damaged fuel rods is assumed to be instantaneously released to the surrounding water as a result of the accident. The licensee is using the source term from the current licensing basis FHA analysis except for the decay period. The current licensing basis FHA analysis used a decay period of 100 hours. The licensee is proposing to change the decay period to 70 hours. All other inputs and assumptions are consistent with the current licensing basis FHA analysis as approved in the alternative source term license amendment nos. 216 (Unit 1) and 213 (Unit 2) (ADAMS Accession No. ML17271A265). The licensee used inputs and assumptions that are consistent with RG 1.183, and, therefore, the NRC staff finds the FHA recently irradiated source term to be acceptable.

3.1.1.2 Transport for the FHA in SFP Area of Auxiliary Building

Releases from the FHA in the SFP are via the plant vent stack with no credit taken for filtration of the iodine from the PRF system. Prior to the FHA in the SFP, the SFP air supply and exhaust systems maintain a slightly negative pressure above the SFP. The licensee assumes the normal ventilation system continues to run at a flow rate of approximately 125 percent of the nominal SFP exhaust flow rate, which is 13,100 cubic feet per minute, therefore, the flow assumed in the analysis is 16,500 cubic feet per minute. All other inputs and assumptions are consistent with the current licensing basis FHA analysis documented in the alternative source term license amendment. Consistent with RG 1.183, the FHA in the SFP is released over a two-hour period. The licensee used inputs and assumptions that are consistent with RG 1.183, and therefore, the NRC staff finds the transport for the FHA in the SFP area of the auxiliary building to be acceptable.

3.1.1.3 Transport for the FHA in Containment

The current licensing basis FHA analysis analyzed three configurations:

1. FHA in containment with the equipment hatch and the personnel airlock open.
2. FHA in containment with the personnel airlock open and the equipment hatch closed.
3. FHA in containment with the personnel airlock closed and the equipment hatch open.

No credit is taken to close these pathways. The release through the open equipment hatch is directly to the environment. The release through the open personnel airlock credits mixing in a portion of the auxiliary building on the same level as the control room and is released to the environment via the plant vent stack. The mixing in the auxiliary building volume is assumed to be instantaneous.

The offsite radiation doses calculated for the open containment equipment hatch and open personnel airlock configuration are based on a maximum combined unfiltered release rate of 80,000 cubic feet per minute and bound the other two configurations. The open personnel airlock could allow areas around the control room to become contaminated, therefore, the licensee's calculation accounts for dose impacts of ingress/egress through the control room doors. All other inputs and assumptions are consistent with the current licensing basis FHA analysis documented in the alternative source term license amendment. Consistent with RG 1.183, the FHA in containment is assumed to result in release over a two-hour period. The licensee used inputs and assumptions that are consistent with RG 1.183, and, therefore, the NRC staff finds the transport for the FHA in containment to be acceptable.

3.1.1.4 Control Room Habitability for the Recently Irradiated FHA

The licensee evaluated control room habitability for the recently irradiated FHA assuming that the activity is released directly to the control room emergency filtration/pressurization system (CREFS) normal intake from the plant vent stack using the plant vent stack to control room atmospheric dispersion factors. The licensee is using the plant vent stack to main control room atmospheric dispersion factors for all the release pathways because the dilution factor is approximately twice the equipment hatch to main control room dilution factor, which results in a higher radionuclide concentration at the main control room ventilation system intake.

In the FHA analysis, the licensee credits the control room normal intake radiation monitors to isolate the control room normal unfiltered flow into the control room. The FHA does not cause a safety injection or containment isolation actuation system signal. Radioactive material from the accident will reach the radiation monitors at the control room intakes, the radiation monitor signal will initiate the automatic isolation of the control room, and then the operators will manually initiate the emergency pressurization mode of CREFS operation. The recently irradiated FHA analysis increases the main control room isolation timing from one minute to two minutes after the event for either FHA location, and the operators take twenty minutes from that time to initiate the pressurization mode. All other inputs and assumptions are consistent with the current licensing basis FHA analysis documented in the alternative source term license amendment. The licensee used inputs and assumptions that are consistent with RG 1.183, and, therefore, the NRC staff finds the control room habitability inputs and assumptions to be acceptable.

3.1.1.5 Recently Irradiated FHA Conclusion

The licensee evaluated the radiological consequences resulting from an FHA with recently irradiated fuel and concluded that the radiation doses at the exclusion area boundary, low population zone, and control room are well within the radiation dose guidelines provided in 10 CFR 50.67 and accident-specific dose criteria specified in SRP Section 15.0.1. The NRC staff's review has found that the licensee used analysis assumptions and inputs consistent with applicable regulatory guidance identified in Section 2.0 of this safety evaluation. The licensee's calculated dose results are given in Table 1 of this SE. The NRC staff performed independent confirmatory dose evaluations as necessary to ensure a thorough understanding of the licensee's methods. The NRC staff finds that the exclusion area boundary, low population zone, and control room doses estimated by the licensee for the FHA with recently irradiated fuel meets the applicable accident dose criteria and are, therefore, acceptable.

3.1.2 Heavy Load Drop Analysis

The NRC staff evaluated the impact of the proposed changes on the heavy load drop analysis as reflected in Joseph M. Farley Nuclear Plant's Updated Final Safety Analysis Report, Revision 28, Section 9.1.7 (ADAMS Accession No. ML18312A074). The licensing basis for the heavy load drop analysis demonstrated that moving a heavy load within the established safe load paths was acceptable and that there will be no consequential damage to the integrity of the fuel cladding or core cooling capability. Because the integrity of the fuel is maintained, there are no resultant radiological consequences associated with the heavy load drop analysis; therefore, the systems impacted by the proposed changes are not required to function as part of this analysis. Based on the above, the NRC staff finds that there is no apparent impact on the heavy load drop analysis, and is, therefore, acceptable.

3.1.3 Removal of the Core Alterations TS Applicability

In letter dated October 4, 2018, from the NRC staff to Technical Specifications Task Force, the NRC staff states, in part:

> After considerable review and analysis, the NRC staff concludes that for certain facilities, LARs adopting TSTF-51 and TSTF-471 could result in exceeding the bounding licensing basis Fuel Handling Accident (FHA) analysis of record dose for the control room and is therefore considered an unanalyzed condition.

After approval of LARs adopting TSTF-51 and TSTF-471, the containment purge and exhaust isolation instrumentation and the containment penetrations are no longer required to be operable during core alterations. The NRC staff identified that dropping a source, fuel assembly, or component during core alterations could damage a recently irradiated fuel assembly creating a radioactive source term that may result in exceeding the resultant radiological doses calculated by the licensing basis FHA analysis of record. Therefore, the NRC staff recommended that when adopting TSTF-51 and TSTF-471, the licensees provide one of the following discussions to remove the defined term "core alterations" from the TS Applicability:

- Confirm that the length of time defined as "recently" is less than the time required to remove the reactor vessel head and internals and expose the irradiated fuel after a shutdown;

- Provide an analysis that demonstrates that the dropping of any unirradiated fuel assembly, sources, reactivity control component, or other component affecting reactivity within the reactor vessel onto irradiated fuel assemblies prior to the period of time defined as "recently" will not result in a radioactive release from the irradiated fuel;

- Describe the limitations or controls that would prevent movement of any unirradiated fuel assembly, source, reactivity control component, or other component affecting reactivity within the reactor vessel capable of damaging a fuel assembly prior to the time period defined as "recently"; or

- Provide an analysis that demonstrates that the dose consequences of a failure of a single irradiated fuel assembly with no technical specification-required mitigation systems available remain below the regulatory limits and the regulatory guidance limits for a fuel handling accident.

The licensee has defined the term "recently" as it relates to irradiated fuel, as fuel that has occupied part of a critical reactor core within the previous 70 hours. Consistent with the first bullet above, the licensee reviewed the historical records of previous refueling outages at Joseph M. Farley Plant, Units 1 and 2, and confirmed that 70 hours is less than the time required to remove the reactor vessel head and internals and expose the irradiated fuel after a reactor shutdown. Based on this, the NRC staff has determined that dropping a source, fuel assembly, or component during core alterations will not damage a recently irradiated fuel assembly. Without the creation of a radioactive source term from a core alterations event, the radiological doses will remain bounded by the proposed FHA with recently irradiated fuel analysis. Therefore, the NRC staff finds the proposed changes acceptable.

3.1.4 Variations from the Approved TSTF-51 and TSTF-471 Travelers

The licensee is proposing the following variations from the TSs changes described in TSTF-51 and TSTF-471 or the applicable parts of TSTF-51 and TSTF-471. These variations do not affect the applicability of TSTF-51 and TSTF-471.

The definition of CORE ALTERATIONS is being retained in TS Section 1.1, "Definitions," because this terminology continues to be used in several TSs, which are not being modified as a result of this amendment request. This is an administrative variation and does not affect the applicability of TSTF-471 to the Farley TSs.

The CREFS actuation instrumentation and the CREFS continue to be assumed to provide isolation, pressurization, and filtration of the main control room in the event of an FHA. Since this system and associated isolation instrumentation are mitigation systems necessary to maintain dose to personnel in the main control room below the regulatory and regulatory guidance limits for an FHA, the following TSs and support TSs and associated TSs Bases are not modified:

- TS 3.3.7, "Control Room Emergency Filtration/Pressurization System (CREFS) Actuation Instrumentation,"
- TS 3.7.10, "Control Room Emergency Filtration/Pressurization System (CREFS),"
- TS 3.7.11, "Control Room Air Conditioning System (CRACS),"
- TS 3.8.2, "AC Sources- Shutdown,"
- TS 3.8.5, "DC Sources- Shutdown,"
- TS 3.8.8, "Inverters- Shutdown,"
- TS 3.8.10, "Distribution Systems- Shutdown," and
- TS 3.9.6, "Refueling Cavity Water Level."

This is a plant-specific variation from TSTF-51 and TSTF-471 that is consistent with the proposed FHA licensing basis and does not affect the applicability of TSTF-51 and TSTF-471 to the Farley TSs.

NUREG-1431, "Standard Technical Specifications Westinghouse Plants," Revision 4.0 (ADAMS Accession No. ML12100A222), TS 3.9.2, "Unborated Water Source Isolation Valves," is included in TSTF-471. TS 3.9.2 in NUREG-1431 contains a reviewer Note that states:

> This Technical Specification is not required for units that have analyzed a boron dilution event in MODE 6. It is required for those units that have not analyzed a boron dilution event in MODE 6. For units which have not analyzed a boron dilution event in MODE 6, the isolation of all unborated water sources is required to preclude this event from occurring.

The boron dilution event is analyzed in Farley's licensing basis, as described in updated final safety analysis report, Section 15.2.4, "Uncontrolled Boron Dilution." Therefore, Farley TSs do not contain a TS LCO for these valves. TS 3.9.2 in NUREG-1431 is not applicable to Farley and, therefore, marked up pages of the associated TSs and licensee-controlled Bases are not included.

The applicability requirements associated with the containment purge and exhaust isolation instrumentation are shown in TS Table 3.3.6-1. This is a formatting difference from the

applicability requirements shown in the NUREG-1431, Revision 1.0 (ADAMS Accession No. ML13196A405), TS 3.3.6 marked up pages in TSTF-51. However, the proposed changes to footnotes in TS Table 3.3.6-1 are consistent with those shown in TSTF-51 and NUREG-1431, Revision 4.0. In addition, proposed deletion of Table 3.3.6-1 footnote (a) results in renumbering the remaining footnotes and associated references to the footnotes. These proposed changes are administrative and do not affect the applicability of TSTF-51 to the Farley TSs.

The plant-specific Note to Condition C in TS 3.3.8 is modified to maintain consistency with the changes to Condition C and Required Action C.1 and is an administrative variation and does not affect the applicability of TSTF-51 to the Farley TSs.

The proposed changes to the Applicability and Actions of TS 3.3.8, "Penetration Room Filtration (PRF) Actuation Instrumentation," and TS 3.7.12, "Penetration Room Filtration (PRF) System," are consistent with the changes identified in NUREG-1431, Revision 1.0, TS 3.3.8, "Fuel Building Air Cleanup System (FBACS) Actuation Instrumentation," and TS 3.7.13, "Fuel Building Air Cleanup System (FBACS)." In addition, a proposed change to add the word "recently" to the SR 3.7.12.1 Note is consistent with the change to the applicability of TS 3.7.12. These proposed differences are plant specific administrative variations and do not affect the applicability of TSTF-51 to the Farley TSs.

The SR 3.7.12.1 Note is modified by revising the word "performed" to "met." Currently, the Note only requires performance of the surveillance during movement of irradiated fuel assemblies in the SFP room. However, TS Section 1.4 explains that the use of "performed" and "met" convey specific meanings. The use of "performed" in the context of the Note to SR 3.7.12.1 would require the surveillance be met, but not performed, in Modes 1, 2, 3, and 4. This is inconsistent with the radiological consequence licensing basis for the loss of coolant accident, which requires the PRF system to be aligned to the PRF rooms in Modes 1, 2, 3, and 4. The intent of this surveillance is to verify that the PRF trains are aligned to the SFP room during movement of irradiated fuel assemblies in the SFP room for the FHA. Modifying the Note to use the word "met" ensures that SR 3.7.12.1 is consistent with the proposed licensing basis for the FHA, in addition to that for the LOCA. This proposed change is considered a variation from TSTF-51 and does not affect the applicability of TSTF-51 to the Farley TSs. Because this proposed change is consistent with the radiological consequence licensing basis for the loss of coolant and fuel handling accidents, the NRC staff finds this proposed change to be acceptable.

The proposed changes to TS 3.9.2, "Nuclear Instrumentation," were not included in TSTF-51 or TSTF-471. These proposed changes are variations from TSTF-51 and TSTF-471. The NRC staff reviewed these proposed changes to determine the impact on the proposed radiological consequences for the FHA with recently irradiated fuel. The NRC staff finds that the proposed changes have no impact on the inputs, assumptions, or methodologies used to determine the radiological consequences for the FHA with recently irradiated fuel, therefore, the proposed changes are acceptable from a radiological dose perspective.

The licensee-controlled TSs Bases are revised, where applicable, consistent with TSTF-51 and TSTF-471. Plant-specific changes are made (additions, deletions, and/or changes) to reflect the plant-specific nomenclature, number, reference, system description, analysis, or licensing basis description, including describing recently irradiated fuel as fuel that has occupied part of a critical reactor core within the previous 70 hours, which is based on the radioactive decay period assumed in the FHA radiological dose analysis. In addition, the word "recently" is added in the TSs Bases in several locations that are not identified in TSTF-51 or TSTF-471 to reflect the proposed changes in the TSs Conditions and Required Actions. These proposed changes are

considered variations from TSTF-51 and TSTF-471 and do not affect the applicability of TSTF-51 or TSTF-471 to the Farley TSs.

3.1.5 NRC Staff Additional Notes

In the LAR, Enclosure 1, Section 3.5, Note 8, the licensee included the following statement, "TSTF-571-T was accepted for use by the NRC as documented in a letter to the Technical Specifications Task Force dated October 4, 2018." This statement could be misleading, inferring NRC staff approval. The NRC staff did not approve the Traveler TSTF-571-T. The October 4, 2018, letter states, in part, that "If a licensee includes the changes of traveler TSTF-571-T when adopting TSTF-286, the NRC staff's technical concerns should be adequately addressed with regard to TSTF-286."

3.1.6 NRC Staff Conclusion

The licensee evaluated the radiological consequences resulting from an FHA and concluded that the radiological consequences at the exclusion area boundary, low population zone, and control room are within the radiological dose guidelines provided in 10 CFR 50.67, 10 CFR 50 Appendix A Criterion 19, and accident-specific dose criteria specified in SRP Section 15.0.1 and RG 1.183. The NRC staff's review has found that the licensee used analysis assumptions and inputs consistent with applicable regulatory guidance identified in Section 2.0. The licensee's calculated dose results are given in Table 1 below. To verify the licensee's analyses, the NRC staff performed confirmatory radiological consequence dose calculations and compared the results to those calculated by the licensee. The radiological consequences calculated by both the licensee and the NRC staff are within the radiation dose criteria set forth in 10 CFR 50.67. The NRC staff finds that the exclusion area boundary, low population zone, and control room doses estimated by the licensee for the FHA with recently irradiated fuel meet the applicable accident-specific dose criteria, there is no impact to the heavy load drop analysis of record, and a new source term will not be created during core alterations. Therefore, the NRC staff finds that licensee's proposed changes are acceptable.

Table 1
Radiological Dose Results (total effective dose equivalent in rem)

Accident	Licensee Dose Results	SRP 15.0.1 and RG 1.183 Dose Acceptance Criteria
Fuel Handling Accident In containment		
Exclusion Area Boundary	2.8	6.3
Low Population Zone	1.0	6.3
Control Room	3.4	5.0
Fuel Handling Accident In Spent Fuel Pool Area		
Exclusion Area Boundary	2.8	6.3
Low Population Zone	1.0	6.3
Control Room	2.9	5.0

As described above, the NRC staff reviewed the technical basis provided by the licensee to assess the radiological impacts of the changes to the FHA analysis in the licensee's TSs. The NRC staff finds that the licensee-proposed TSs changes (TS 3.3.6, TS 3.3.8, TS 3.7.12, TS 3.9.1, TS 3.9.2, TS 3.9.3) are consistent with the regulatory requirements and guidance identified in Section 2.0 of this safety evaluation. Therefore, the NRC staff finds that the proposed TSs changes are acceptable regarding the radiological consequences of the postulated DBAs. In addition, the TSs changes stated in section 2.2 of this safety evaluation meet 10 CFR 50.36(b) and are acceptable because they are derived from the FHA analysis and its evaluation.

3.2 Reactor Systems Review

The proposed changes to TS 3.9.1, "Boron Concentration," and TS 3.9.2, "Nuclear Instrumentation," would affect their Required Action A.1, which requires immediate suspension of CORE ALTERATIONS when the boron concentration is not within the required limits, and when one or two required source range neutron flux monitors (SRNFMs) are inoperable, respectively, while in Mode 6. The NRC staff reviewed the changes and justifications for the changes.

3.2.1 Proposed TS 3.9.1, Boron Concentration

3.2.1.1 Current TS 3.9.1

Current TS LCO 3.9.1 requires that the boron concentration be within the limits specified in the Core Operating Limits Report (COLR) during operation in Mode 6. When the boron concentration is not within the limits, Required Actions A.1, A.2, and A3 require the operator to immediately suspend CORE ALTERATIONS, suspend positive reactivity addition, and initiate action to restore boron concentration to within the limits, respectively.

3.2.1.2 Changes to TS 3.9.1

Maintaining boron concentration within limits in Mode 6 is required by TS 3.9.1 to assure that a core k_{eff} of 0.95 is maintained during refueling conditions. The licensee proposed the following changes to Required Actions in TS 3.9.1:

> Required Action A.1, "Suspend CORE ALTERATIONS," and the associated Completion Time are deleted and Required Actions A.2 and A.3 are renumbered to A.1 and A.2 without changes to the associated requirements.

3.2.1.3 Acceptability of TS 3.9.1

CORE ALTERATIONS are defined as the movement of any fuel, sources, or reactivity control components within the reactor vessel with the vessel head removed and fuel in the vessel. CORE ALTERATIONS could involve the addition of fuel assemblies to the reactor vessel and the withdrawal of control rods, resulting in positive reactivity additions. With the proposed deletion of immediately suspending CORE ALTERATIONS, the proposed Required Action A.1 (current Required Action A.2) still requires immediate suspension of positive reactivity additions, which would prohibit diluting the boron concentration of the coolant in the reactor coolant system (RCS), adding fuel assemblies to the reactor vessel, or removing reactivity control components, and proposed Required Action A.2 (current Required Action A.3) continues to require the operator to initiate action to restore boron concentration to within the limits in the

COLR. Therefore, the proposed Required Actions A.1 and A.2 would continue to assure that the requirements of boron concentration limits are met and is consistent with STS 3.9.1 in NUREG-1431, Revision 4.

The proposed TS 3.9.1 continues to assure the requirements of boron concentration limits will be met and is consistent with STS 3.9.1 in NUREG-1431, Revision 4. Therefore, the NRC staff finds that the proposed TS 3.9.1 is acceptable.

3.2.2 Proposed TS 3.9.2, Nuclear Instrumentation

3.2.2.1 Current TS 3.9.2

The SRNFMs are used during operation in Mode 6 to monitor the core reactivity condition. The SRNFMs provide a signal to alert the operator to unexpected changes in core reactivity and the audible count rate from the SRNFMs provides prompt and definite indication to the operator to recognize the initiation of a boron dilution event. Current TS LCO 3.9.2 requires two operable SRNFMs and one operable channel of audible count rate during operation in Mode 6. With one SRNFM inoperable, Required Actions A.1 and A.2 require the operator to immediately suspend CORE ALTERATIONS, and suspend positive reactivity additions, respectively. With two SRNFMs inoperable, Required Actions B.1 and B.2 require the operator to immediately initiate action to restore one SRNFM to operable status, and perform Surveillance Requirement (SR) 3.9.1.1 once per 12 hours. SR 3.9.1.1 requires the operator to verify that the boron concentration is within the limits specified in the COLR with the frequency in accordance with the Surveillance Frequency Control Program.

3.2.2.2 Changes to TS 3.9.2

The licensee revised Conditions A and B in TS 3.9.2 to include the word "required" when referring to one or two inoperable SRNFMs, and added the following Note to Required Action A.1:

----------NOTE----------
CORE ALTERATIONS may
continue to restore an
inoperable source range
neutron flux monitor.

3.2.2.3 Acceptability of Addition of the Word "Required" to Conditions A and B

Since there are three installed SRNFMs available to meet LCO 3.9.2, the licensee proposed to add the word "required" to Conditions A and B when referring to one or two inoperable SRNFMs. The NRC staff finds that the proposed word addition is an administrative change in nature, and it does not inadvertently affect the TS requirements and is, therefore, acceptable.

3.2.2.4 Acceptability of the Added Note to TS 3.9.2 Required Action A.1

TS 3.9.2 required two operable SRNFMs to provide a signal to alert the operator to unexpected changes in core reactivity. With one SRNFM inoperable, the existing Required Action A.1 requires immediate suspension of CORE ALTERATIONS. The proposed Note added to TS 3.9.2 Required Action A.1, allowing CORE ALTERATIONS to continue, would permit fuel

assemblies, sources, and reactivity control components to be moved, if necessary, to restore an inoperable SRNFM.

While the proposed Note is added to TS 3.9.2 Required Action A.1, the existing Required Action A.2, which requires immediately suspending positive reactivity additions, remains unchanged. This action would prohibit the positive reactivity changes in the core, including the dilution of the boron concentration of the coolant in the RCS, the loading of fuel assemblies or sources into the core, or the removal of reactivity control components. The NRC staff finds that the proposed Note added to Required Action A.1 with the existing Required Action A.2, requiring immediately suspending positive reactivity additions, does not reduce the current TS 3.9.2 requirement to continue minimizing positive reactivity changes within the core, while providing the ability to safely restore the SRNFM capability, and therefore, the proposed Note is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of Alabama official was notified of the proposed issuance of the amendments on June 7, 2019. On June 10, 2019, the State official confirmed that the State of Alabama had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding published in the *Federal Register* on January 30, 2019 (84 FR 495). Accordingly, the amendments meet 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 amendments.

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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors:

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Date: July 16, 2019

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS RE: REVISE TECHNICAL SPECIFICATION REQUIREMENTS DURING HANDLING IRRADIATED FUEL AND CORE ALTERATIONS TSTF-51 AND TSTF-471 (EPID L-2018-LLA-0486 AND L-2018-LLA-0487) DATED JULY 16, 2019

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