

January 17, 2019

TSTF-19-01  
PROJ0753

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


**SUBJECT:** TSTF Comments on Draft Safety Evaluations for Traveler TSTF-566, Revision 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems"

**REFERENCE:** Letter Victor Cusumano (NRC) to the TSTF, "Draft Safety Evaluations of Technical Specifications Task Force TSTF-566, Revision 0, 'Revise Actions for Inoperable RHR Shutdown Cooling Subsystems'," dated December 20, 2018 (ADAMS Accession No. ML18242A176).

On January 19, 2018, the TSTF submitted traveler TSTF-566, Revision 0, "Revise Actions for Inoperable RHR Shutdown Cooling Subsystems," to the Nuclear Regulatory Commission (NRC) for review (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18019B187). In the referenced letter, the NRC provided the draft Safety Evaluations for TSTF-566 for comment.

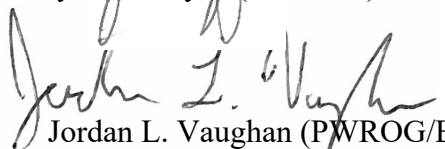
Attachment 1 contains a summary table providing the TSTF's comments on the draft Safety Evaluations. Attachment 2 contains a mark-up reflecting the TSTF's comments.

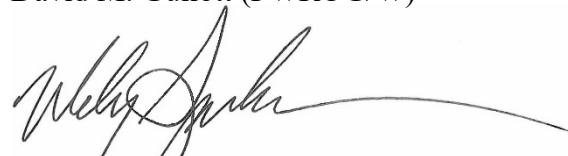
Should you have any questions, please do not hesitate to contact us.

  
James P. Miksa (PWROG/CE)

  
Ryan M. Joyce (BWROG)

  
David M. Gullott (PWROG/W)

  
Jordan L. Vaughan (PWROG/B&W)

  
Wesley Sparkman (APOG)

Attachment 1 TSTF Comments on the TSTF-566 Draft Safety Evaluations  
Attachment 2 TSTF Markup of Draft Safety Evaluations

cc: Michelle Honcharik, Technical Specifications Branch, NRC  
Victor Cusumano, Technical Specifications Branch, NRC

**Attachment 1**  
**TSTF Comments on the TSTF-566 Draft Safety Evaluations**

**Comments on the TSTF-566 Traveler Draft Safety Evaluation**

<b>Page(s)</b>	<b>Line(s)<sup>1</sup></b>	<b>Comment</b>
1 2	37 1-6	Recommend that the RHR system description be revised to be consistent with the traveler, which was worded to encompass differences in the Boiling Water Reactor design.
7	28-43	TSTF-566 includes changes to the NUREG-1433 TS 3.4.8, 3.4.9, 3.9.8, and 3.9.9 Bases and the NUREG-1434 TS 3.4.9, 3.4.10, 3.9.8, and 3.9.9 Bases justifying the use of an inoperable but functional RHR SDC subsystem as an alternate method of removing decay heat (see TSTF-566 justification, Section 3.3, "Bases Changes.") These changes are not discussed in Section 3.3, "Consideration of Changes to the Standard Technical Specification Bases," which only addresses Bases changes related to the Technical Specification changes made in TSTF-566. Recommend the Safety Evaluation be revised to address these changes.

**Comments on the TSTF-566 Draft Model Safety Evaluation**

<b>Page(s)</b>	<b>Line(s)<sup>1</sup></b>	<b>Comment</b>
2	6-7 17-25	The model Safety Evaluation contains a note that states that the technical reviewers and/or project manager should verify that the RHR shutdown cooling system description is applicable to the plant and revise the section if necessary. However, the model application does not require the licensee to describe the plant's RHR shutdown cooling system and the applicability of the proposed change is not dependent on the RHR shutdown cooling system design details. To avoid unnecessary requests for additional information regarding the RHR shutdown cooling system design, we recommend deleting the note and replacing the system description with the generic system description in TSTF-566.

---

<sup>1</sup> Line numbers correspond to the attached proposed revision, not to the documents provided by the NRC.

**Attachment 2**  
**TSTF Markup of Draft Safety Evaluations**

1 **DRAFT SAFETY EVALUATION**

2 **BY THE OFFICE OF NUCLEAR REACTOR REGULATION**

3 **TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER**

4 **TSTF-566, REVISION 0**

5 **“REVISE ACTIONS FOR INOPERABLE RHR SHUTDOWN COOLING SUBSYSTEM”**

6 **USING THE CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS**

7 **(EPID L-2018-PMP-0001)**

8  
9  
10 **1.0 INTRODUCTION**

11  
12 By letter dated January 19, 2018 (Agencywide Documents Access and Management System  
13 (ADAMS) Accession No. ML18019B187), the Technical Specifications Task Force (TSTF)  
14 submitted traveler TSTF-566, Revision 0, “Revise Actions for Inoperable RHR [Residual Heat  
15 Removal] Shutdown Cooling Subsystems.” Traveler TSTF-566, Revision 0, proposed changes  
16 to the Standard Technical Specifications (STS) for boiling-water reactor (BWR) designs.<sup>1</sup> These  
17 changes would be incorporated into future revisions of NUREG-1433 and NUREG-1434.

18  
19 The proposed changes would revise TS actions for inoperable RHR shutdown cooling  
20 subsystems in the RHR shutdown cooling system limiting conditions for operation (LCOs).  
21 This STS change will be made available to licensees through the consolidated line item  
22 improvement process.

23  
24 **2.0 REGULATORY EVALUATION**

25  
26 **2.1 DESCRIPTION OF THE RESIDUAL HEAT REMOVAL SHUTDOWN**  
27 **COOLING SYSTEM**

28  
29 Irradiated fuel in the shutdown reactor core generates heat during the decay of fission products  
30 and increases the temperature of the reactor coolant. This decay heat must be removed to  
31 reduce the temperature of the reactor coolant to less than or equal to 200 degrees  
32 Fahrenheit (°F). This decay heat is removed by the RHR shutdown cooling system in  
33 preparation for performing refueling or maintenance operations, or for keeping the reactor in the  
34 hot shutdown condition or cold shutdown condition.

35  
36 Typical BWR designs consist of two redundant, manually controlled shutdown cooling  
37 subsystems of the RHR system to provide decay heat removal. Each loop consists of *one or*

---

<sup>1</sup> U.S. Nuclear Regulatory Commission, “Standard Technical Specifications, General Electric Plants, BWR/4,” NUREG-1433, Volume 1, “Specifications,” and Volume 2, “Bases,” Revision 4.0, April 2012 (ADAMS Accession Nos. ML12104A192 and ML12104A193, respectively).

U.S. Nuclear Regulatory Commission, “Standard Technical Specifications, General Electric Plants, BWR/6,” NUREG-1434, Volume 1, “Specifications,” and Volume 2, “Bases,” Revision 4.0, April 2012 (ADAMS Accession Nos. ML12104A195 and ML12104A196, respectively).

two motor-driven pumps, a heat exchanger, and associated piping and valves. *The RHR heat exchangers transfer heat to the RHR Service Water System. Some piping and heat exchangers that are passive components may be common to both subsystems. Both loops have a common suction from the same recirculation loop. Each pump discharges the reactor coolant, after circulation through the respective heat exchanger, to the reactor via the associated recirculation loop.*

Technical Specification 3.4.8 for NUREG-1433 and TS 3.4.9 for NUREG-1434, "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown," are applicable in Mode 3 with reactor steam dome pressure lower than the RHR cut-in permissive pressure. Technical Specification 3.4.9 for NUREG-1433 and TS 3.4.10 for NUREG-1434, "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown," are applicable in Mode 4. They all require two operable RHR shutdown cooling subsystems and, with no recirculation pump in operation, at least one RHR shutdown cooling subsystem in operation.

## 2.2 PROPOSED CHANGES TO THE STANDARD TECHNICAL SPECIFICATIONS

The proposed changes would revise TS 3.4.8 for NUREG-1433 and TS 3.4.9 for NUREG-1434, "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown," and TS 3.4.9 for NUREG-1433 and TS 3.4.10 for NUREG-1434, "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown." The proposed changes are described below.

### 2.2.1 Proposed Changes to "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown"

Required actions for one or two RHR shutdown cooling subsystems inoperable (Condition A) of TS 3.4.8 for NUREG-1433 and TS 3.4.9 for NUREG-1434, "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown," require the operators to initiate action to restore RHR shutdown cooling subsystem(s) to operable status (Required Action A.1) immediately, verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem (Required Action A.2) within 1 hour, and be in Mode 4 (Required Action A.3) within 24 hours.

Traveler TSTF-566, Revision 0, proposed to move Required Action A.1 to new Condition B (as Required Action B.1) and delete Required Action A.3. It also proposed to add a recurring completion time (CT) to current Required Action A.2 of "once per 24 hours thereafter." The traveler renumbers current Required Action A.2 as A.1, since Required Actions A.1 and A.3 are removed from Condition A.

Traveler TSTF-566, Revision 0, also proposed a new Condition B for when the required action and associated CT of Condition A are not met. New Condition B's Required Action B.1 is moved from current Required Action A.1 and requires operators to initiate action to restore RHR shutdown cooling subsystem(s) to operable status immediately.

Current Required Action A.2 was renumbered as A.1 since Required Actions A.1 and A.3 were deleted. Current Condition B and its required actions were renamed "C," "C.1," "C.2," and "C.3," respectively, since new Condition B was added. Conforming changes were also made to the STS Bases.

2.2.2 Proposed Changes to “Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown”

Required actions for one or two RHR shutdown cooling subsystems inoperable (Condition A) of TS 3.4.9 for NUREG-1433 and TS 3.4.10 for NUREG-1434, “Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown,” require the operators to verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem (Required Action A.1) within 1 hour and once per 24 hours thereafter.

Traveler TSTF-566, Revision 0, proposed a new Condition B for when the required action and associated CT of Condition A is not met, which has a required action (new Required Action B.1) for operators to initiate action to restore RHR shutdown cooling subsystem(s) to operable status immediately.

Current Condition B and its required actions were renamed “C,” “C.1,” and “C.2,” respectively, since new Condition B was added. Conforming changes were also made to the STS Bases.

2.3 APPLICABLE REGULATORY REQUIREMENTS AND GUIDANCE

Section IV, “The Commission Policy,” of the “Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors,” published in the *Federal Register* on July 22, 1993 (58 FR 39132), states, in part:

The purpose of Technical Specifications is to impose those conditions or limitations upon reactor operation necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety by identifying those features that are of controlling importance to safety and establishing on them certain conditions of operation which cannot be changed without prior Commission approval.

...[T]he Commission will also entertain requests to adopt portions of the improved STS [(e.g., TSTF-566)], even if the licensee does not adopt all STS improvements. ...The Commission encourages all licensees who submit Technical Specification related submittals based on this Policy Statement to emphasize human factors principles.

...In accordance with this Policy Statement, improved STS have been developed and will be maintained for each NSSS [nuclear steam supply system] owners group. The Commission encourages licensees to use the improved STS as the basis for plant-specific Technical Specifications. ...[I]t is the Commission intent that the wording and Bases of the improved STS be used ... to the extent practicable.

The Commission Policy concerning Bases is, in part:

Each LCO, Action, and Surveillance Requirement should have supporting Bases. The Bases should at a minimum address the

following questions and cite references to appropriate licensing documentation (e.g., FSAR, Topical Report) to support the Bases.

1. What is the justification for the Technical Specification, i.e., which Policy Statement criterion requires it to be in the Technical Specifications?

2. What are the Bases for each LCO, i.e., why was it determined to be the lowest functional capability or performance level for the system or component in question necessary for safe operation of the facility and, what are the reasons for the Applicability of the LCO?

3. What are the Bases for each Action, i.e., why should this remedial action be taken if the associated LCO cannot be met; how does this Action relate to other Actions associated with the LCO; and what justifies continued operation of the system or component at the reduced state from the state specified in the LCO for the allowed time period?

As described in the Commission's "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," the NRC and industry task groups for new STS recommended that improvements include greater emphasis on human factors principles in order to add clarity and understanding to the text of the STS, and provide improvements to the Bases of STS, which provides the purpose for each requirement in the specification. The improved vendor-specific STS were developed and issued by the NRC in September 1992.

The regulation at Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(b) requires:

Each license authorizing operation of a ... utilization facility ... will include technical specifications. 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 ["Contents of applications; technical information"]. The Commission may include such additional technical specifications as the Commission finds appropriate.

Per regulation at 10 CFR 50.40, "Common Standards:"

In determining that [an] operating license ... will be issued to an applicant, the Commission will be guided by the following considerations:

(a) ... the processes to be performed, the operating procedures, the facility and equipment, the use of the facility, and other technical specifications, or the proposals, in regard to any of the foregoing collectively provide reasonable assurance that the applicant will comply with the regulations in this chapter, including the regulations in part 20 of this chapter, and that the health and safety of the public will not be endangered.



The NRC staff's guidance for the review of TSs is in Chapter 16.0, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR [Light-Water Reactor] Edition" (SRP), March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared STS for each of the LWR nuclear designs. Accordingly, the NRC staff's review includes consideration of whether the proposed changes are consistent with the applicable reference STS (i.e., the current STS), as modified by NRC-approved travelers. In addition, the guidance states that comparing the change to previous STS can help clarify the TS intent.

### **3.0 TECHNICAL EVALUATION**

#### **3.1 PROPOSED CHANGES TO "RESIDUAL HEAT REMOVAL (RHR) SHUTDOWN COOLING SYSTEM – HOT SHUTDOWN"**

In traveler TSTF-566, Revision 0, the TSTF proposed to modify TS 3.4.8 for NUREG-1433 and TS 3.4.9 for NUREG-1434, "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown." The technical evaluation of each change follows.

##### **3.1.1 Evaluation of Changes to Condition A**

Traveler TSTF-566, Revision 0, proposed to add a recurring CT to current Required Action A.2 of "once per 24 hours thereafter." Current Required Action A.2 requires verification that an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem within 1 hour. The NRC staff finds this change is acceptable since it requires continuous verification of alternate methods of decay heat removal every 24 hours and provides assurance of continued heat removal capability.

Traveler TSTF-566, Revision 0, also proposed to delete current Required Action A.3 which requires the plant to be in Mode 4 within 24 hours when one or two RHR shutdown cooling subsystems are inoperable. Current Required Action A.3 requires operators to reduce the reactor coolant system temperature to the point where Mode 4 is entered due to the potentially reduced reliability of the alternate methods of decay heat removal. However, if there is no operable RHR shutdown cooling subsystem and the plant is in a period of high decay heat load, it may not be possible to reduce the reactor coolant system temperature to the Mode 4 entry condition (typically less than 200 °F) within the CT. In addition, in a typical BWR design, the RHR shutdown cooling system has a heat rejection capability many times greater than alternate methods available. Therefore, for periods in which there is high decay heat load, the BWR design does not include any system which can satisfy Required Action A.3. The NRC staff finds the deletion of current Required Action A.3 is acceptable because, at below the RHR cut-in permissive pressure, the remaining required action will continue to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

Current Required Action A.2 is renumbered as A.1, since Required Actions A.1 and A.3 are removed from Condition A. The NRC staff finds this change is acceptable since it provides the correct number sequence.

1 3.1.2 Evaluation of New Condition B

2  
3 Traveler TSTF-566, Revision 0, proposed a new Condition B for when required action and  
4 associated CT of Condition A is not met. New Condition B's required action, B.1, is moved from  
5 current Required Action A.1 and requires operators to initiate action to restore RHR shutdown  
6 cooling subsystems(s) to operable status immediately. The NRC staff finds that relocating the  
7 required action from A.1 to new Required Action B.1 is acceptable because other ways of  
8 removing decay heat are available, such as natural circulation, the spent fuel pool cooling  
9 system, the reactor water cleanup system, and an inoperable but functional RHR shutdown  
10 cooling subsystem.

11  
12 If an alternate method cannot be established (Condition A), new Condition B requires the  
13 licensee to immediately initiate action to restore the inoperable RHR shutdown cooling  
14 subsystem(s) to operable status. The CT "immediately" is defined in Section 1.3 of the TSs as,  
15 "the Required Action should be pursued without delay and in a controlled manner." New  
16 Required Action B.1 continues to apply until the inoperable RHR shutdown cooling subsystems  
17 are restored to operable status, an alternate decay heat removal method is established, or the  
18 specification is exited.

19  
20 The NRC staff finds this change is acceptable because new Condition B with its Required  
21 Action B.1 provide an appropriate action for when an alternate method cannot be established  
22 within the CT. In addition, new Required Action B.1 will restore redundant decay heat removal  
23 paths and the immediate CT reflects the importance of maintaining the availability of two paths  
24 for heat removal.

25  
26 3.1.3 Evaluation of Changes to Existing Condition B

27  
28 Current Required Action A.2 was renumbered as A.1, since Required Actions A.1 and A.3 were  
29 deleted. Current Condition B and its required actions were renamed "C," "C.1," "C.2," and "C.3,"  
30 respectively, since new Condition B was added. The NRC staff finds this change is acceptable  
31 since it provides the correct number sequence.

32  
33 3.1.4 Conclusion of Proposed Changes to "Residual Heat Removal (RHR)  
34 Shutdown Cooling System – Hot Shutdown"

35  
36 The NRC staff concludes the proposed changes are acceptable since the remedial actions  
37 provide reasonable assurance that the health and safety of the public will not be endangered.

38  
39 3.2 PROPOSED CHANGES TO "RESIDUAL HEAT REMOVAL (RHR)  
40 SHUTDOWN COOLING SYSTEM – COLD SHUTDOWN"

41  
42 In traveler TSTF-566, Revision 0, the TSTF proposed to modify TS 3.4.9 for NUREG-1433 and  
43 TS 3.4.10 for NUREG-1434, "Residual Heat Removal (RHR) Shutdown Cooling System – Cold  
44 Shutdown." The technical evaluation of each change follows.

45  
46 3.2.1 Evaluation of New Condition B

47  
48 Traveler TSTF-566, Revision 0, proposed a new Condition B for when required action and  
49 associated CT of Condition A is not met which has a required action (new Required Action B.1)  
50 for operators to initiate action to restore RHR shutdown cooling subsystems(s) to operable  
51 status immediately.

If an alternate method cannot be established (Condition A), new Condition B requires the licensee to immediately initiate action to restore the inoperable RHR shutdown cooling subsystem(s) to operable status. The CT "immediately" is defined in Section 1.3 of the TSs as, "the Required Action should be pursued without delay and in a controlled manner." New Required Action B.1 continues to apply until the inoperable RHR shutdown cooling subsystems are restored to operable status, an alternate decay heat removal method is established, or the specification is exited.

The NRC staff finds this change is acceptable because new Condition B with its Required Action B.1 provides an appropriate terminal action for when an alternate method cannot be established within the CT. In addition, new Required Action B.1 will restore redundant decay heat removal paths and the immediate CT reflects the importance of maintaining the availability of two paths for heat removal.

### 3.2.2 Evaluation of Changes to Existing Condition B

Current Condition B and its required actions were renamed "C," "C.1," and "C.2," respectively, since new Condition B was added. The NRC staff finds this change is acceptable since it provides the correct number sequence.

### 3.2.3 Conclusion of Proposed Changes to "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown"

The NRC staff concludes the proposed changes are acceptable since the remedial actions provide reasonable assurance that the health and safety of the public will not be endangered.

## 3.3 CONSIDERATION OF CHANGES TO THE STANDARD TECHNICAL SPECIFICATION BASES

Traveler TSTF-566, Revision 0, proposed changes to the STS Bases that conformed to the TS changes made. Specifically moving Action A.1 and renumbering it as B.1, and renumbering the other actions accordingly. The proposed changes to the STS Bases explain that if the required alternate method(s) of decay heat removal cannot be verified within one hour as required by Action A.1, immediate action must be taken to restore the inoperable RHR shutdown cooling subsystem(s). It continues by stating that the new required action will restore redundant decay heat removal paths and its immediate CT reflects the importance of maintaining the availability of two paths for heat removal. The NRC staff finds the Bases for each Action acceptable because they are editorial in nature (movement of existing wording and renumbering to match new TS numbering) and continue to provide the reasons or bases for the specifications, as described in 10 CFR 50.36(a). The Bases for addition of a recurring CT for Action A.2 of "once per 24 hours thereafter," is acceptable based on engineering judgement because the continuous verification will provide assurance of continued heat removal capability.

## 4.0 CONCLUSION

The NRC staff reviewed traveler TSTF-566, Revision 0, which proposed changes to NUREG-1433 and NUREG-1434. The NRC staff determined that the proposed changes to the STS continue to meet the Commission's "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors" and 10 CFR 50.36. Additionally, the changes to the STS were reviewed and found to be technically clear and consistent with customary terminology.

1 and format in accordance with SRP Chapter 16.0. The NRC staff reviewed the proposed  
2 changes to the action statements and concludes that the changes continue to provide  
3 reasonable assurance and protection of the health and safety of the public. Therefore, the NRC  
4 staff concludes that the proposed TS changes are acceptable.

5  
6 Principal Contributors: C. Tilton, NRR/DSS  
7 M. Razzaque, NRR/DSS  
8

9 Date:

1 *General Directions: This Model safety evaluation (SE) provides the format and content to be*  
2 *used when preparing the plant-specific SE of a license amendment request to adopt TSTF-566,*  
3 *Revision 0. The **bolded** bracketed information shows text that should be filled in for the specific*  
4 *amendment; individual licensees would furnish site-specific nomenclature or values for these*  
5 *bracketed items. The italicized wording provides guidance on what should be included in each*  
6 *section and should not be included in the SE.*  
7

8 **DRAFT SAFETY EVALUATION**

9 **BY THE OFFICE OF NUCLEAR REACTOR REGULATION**

10 **TECHNICAL SPECIFICATIONS TASK FORCE TRAVELER**

11 **TSTF-566, REVISION 0**

12 **“REVISE ACTIONS FOR INOPERABLE RHR SHUTDOWN COOLING SUBSYSTEM”**

13 **USING THE CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS**

14  
15  
16 **1.0 INTRODUCTION**  
17

18 By application dated [enter date], (Agencywide Documents Access and Management System  
19 (ADAMS) Accession No. [MLXXXXXXXXXX]), [as supplemented by letters dated [enter  
20 date(s)]], [name of licensee] (the licensee) submitted a license amendment request (LAR) for  
21 [name of facility (abbreviated name), applicable units]. The amendment would revise  
22 technical specification (TS) actions for inoperable residual heat removal (RHR) shutdown  
23 cooling subsystems in the RHR shutdown cooling system limiting conditions for operation  
24 (LCOs).  
25

26 The proposed changes are based on Technical Specifications Task Force (TSTF) traveler  
27 TSTF-566, Revision 0, “Revise Actions for Inoperable RHR Shutdown Cooling Subsystems,”  
28 dated January 19, 2018 (ADAMS Accession No. ML18019B187). The U.S. Nuclear Regulatory  
29 Commission (NRC or the Commission) issued a final safety evaluation (SE) approving  
30 TSTF-566, Revision 0, on [enter date] (ADAMS Accession No. [MLXXXXXXXXXX]).  
31

32 **[The licensee has proposed variations from the TS changes described in TSTF-566,**  
33 **Revision 0. The variations are described in Section [2.2.1] of this SE and evaluated in**  
34 **Section [3.3]]. OR [The licensee is not proposing any variations from the TS changes**  
35 **described in TSTF-566 or the applicable parts of the NRC staff’s SE of TSTF-566.]]**  
36

37 **[The supplemental letters dated [enter date(s)], provided additional information that**  
38 **clarified the application, did not expand the scope of the application as originally**  
39 **noticed, and did not change the NRC staff’s original proposed no significant hazards**  
40 **consideration determination as published in the *Federal Register* on [enter date] (cite FR**  
41 **reference).]**  
42

## 2.0 REGULATORY EVALUATION

### 2.1 DESCRIPTION OF RESIDUAL HEAT REMOVAL SHUTDOWN COOLING SYSTEM

~~{NOTE: Technical reviewers and/or the project manager should verify that the RHR shutdown cooling system description is applicable to this plant and revise this section if necessary.}~~

Irradiated fuel in the shutdown reactor core generates heat during the decay of fission products and increases the temperature of the reactor coolant. This decay heat must be removed to reduce the temperature of the reactor coolant to less than or equal to 200 degrees Fahrenheit (°F). This decay heat is removed by the RHR shutdown cooling system in preparation for performing refueling or maintenance operations, or for keeping the reactor in the hot shutdown condition or cold shutdown condition.

The two redundant, manually controlled shutdown cooling subsystems of the RHR system provide decay heat removal. ~~Each of the two shutdown cooling subsystems of the RHR System can provide the required decay heat removal. Each RHR shutdown cooling subsystem consists of one or two motor driven pumps, a heat exchanger, and associated piping and valves. The RHR heat exchangers transfer heat to the RHR Service Water System. Some piping and heat exchangers that are passive components may be common to both subsystems. Each loop consists of two motor driven pumps, a heat exchanger, and associated piping and valves. Both loops have a common suction from the same recirculation loop. Each pump discharges the reactor coolant, after circulation through the respective heat exchanger, to the reactor via the associated recirculation loop.~~

Technical Specification [3.4.8], "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown," is applicable on Mode 3 **[with reactor steam dome pressure lower than the RHR cut-in permissive]** pressure. Technical Specification [3.4.9], "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown," is applicable in Mode 4. They both require two operable RHR shutdown cooling subsystems and, with no recirculation pump in operation, at least one RHR shutdown cooling subsystem in operation.

### 2.2 PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS

The licensee proposed to revise TS actions for inoperable RHR shutdown cooling subsystems in the RHR shutdown cooling system LCOs, consistent with TSTF-566, Revision 0.

The proposed changes would revise TS [3.4.8], "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown," and [3.4.9], "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown," for **[Name of facility]**. The proposed changes are described below.

#### 2.2.1 Proposed Changes to "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown"

Required actions for one or two RHR shutdown cooling subsystems inoperable (Condition A) of **[Name of facility]** TS [3.4.8], "Residual Heat Removal (RHR) Shutdown Cooling System – Hot Shutdown," require the operators to initiate action to restore RHR shutdown cooling subsystem(s) to operable status (Required Action A.1) immediately, verify an alternate method

of decay heat removal is available for each inoperable RHR shutdown cooling subsystem (Required Action A.2) within 1 hour, and be in Mode 4 (Required Action A.3) within 24 hours.

The licensee proposed to move Required Action A.1 to new Condition B (as Required Action B.1) and delete Required Action A.3. The LAR also proposed to add a recurring completion time (CT) to current Required Action A.2 of "once per 24 hours thereafter." The proposed changes also renumber current Required Action A.2 as A.1 since Required Actions A.1 and A.3 are removed from Condition A.

The licensee also proposed a new Condition B for when the required action and associated CT of Condition A are not met. New Condition B's Required Action B.1 is moved from current Required Action A.1 and requires operators to initiate action to restore RHR shutdown cooling subsystem(s) to operable status immediately.

Current Required Action A.2 was renumbered as A.1, since Required Actions A.1 and A.3 were deleted. Current Condition B and its required actions were renamed "C," "C.1," "C.2," and "C.3," respectively, since new Condition B was added. .

#### 2.2.2 Proposed Changes to "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown"

Required actions for one or two RHR shutdown cooling subsystems inoperable (Condition A) of TS [3.4.9], "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown," require the operators to verify an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem (Required Action A.1) within 1 hour and once per 24 hours thereafter.

The licensee proposed a new Condition B for when the required action and associated CT of Condition A are not met which has a required action (new Required Action B.1) for operators to initiate action to restore RHR shutdown cooling subsystem(s) to operable status immediately.

Current Condition B and its required actions were renamed "C," "C.1," and "C.2," respectively, since new Condition B was added. .

#### 2.2.1 Variations from TSTF-566

*{NOTE: Technical reviewers and/or the project manager are to assess the adequacy of any variations from the approved traveler and document their acceptability. Choose the applicable paragraphs based on information provided in the LAR.}*

**[The licensee is proposing the following variations from the TS changes described in TSTF-566 or the applicable parts of the NRC staff's SE of TSTF-566. [Describe the variations and why TSTF-566 is still applicable.] These variations do not affect the applicability of TSTF-566 or the NRC staff's SE to the proposed LAR.]**

**[The [PLANT] TSs utilize different [numbering][and][titles] than the Standard Technical Specifications (STS) on which TSTF-566 was based. Specifically, [describe differences between the plant-specific TS numbering and/or titles and the TSTF-566 numbering and/or titles.] These differences are editorial and do not affect the applicability of TSTF-566 to the proposed LAR.]**

[The [PLANT] design is different than the model plant assumed in the Standard Technical Specifications, but the TSTF-566 justification and the NRC staff's SE are still applicable. [Describe differences and why TSTF-566 is still applicable.]]

### 2.3 APPLICABLE REGULATORY REQUIREMENTS AND GUIDANCE

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(a)(1) requires each applicant for a license authorizing operation of a utilization facility to include in the application proposed TSs.

The regulation at 10 CFR 50.36(b) requires:

Each license authorizing operation of a ...utilization facility ...will include technical specifications. 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 ["Contents of applications; technical information"]. The Commission may include such additional technical specifications as the Commission finds appropriate.

The regulation at 10 CFR 50.40(a) in part states that the technical specifications shall provide reasonable assurance that the health and safety of the public will not be endangered.

The regulation at 10 CFR 50.36(a)(1) states, in part: "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 technical specifications."

The NRC staff's guidance for the review of TSs is in Chapter 16.0, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR [Light-Water Reactor] Edition" (SRP), March 2010 (ADAMS Accession No. ML100351425). As described therein, as part of the regulatory standardization effort, the NRC staff has prepared Standard Technical Specifications (STS) for each of the LWR nuclear designs. Accordingly, the NRC staff's review includes consideration of whether the proposed changes are consistent with the applicable reference STS (i.e., the current STS), as modified by NRC-approved travelers.

{NOTE: Choose applicable STS}

**[U.S. Nuclear Regulatory Commission, "Standard Technical Specifications, General Electric BWR/4 Plants," NUREG-1433, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4.0, April 2012 (ADAMS Accession Nos. ML12104A192 and ML12104A193, respectively).**

**U.S. Nuclear Regulatory Commission, "Standard Technical Specifications, General Electric BWR/6 Plants," NUREG-1434, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4.0, April 2012 (ADAMS Accession Nos. ML12104A195 and ML12104A196, respectively).]**



### 3.0 TECHNICAL EVALUATION

#### 3.1 PROPOSED CHANGES TO "RESIDUAL HEAT REMOVAL (RHR) SHUTDOWN COOLING SYSTEM – HOT SHUTDOWN"

The licensee proposed to modify TS [3.4.8], "Residual Heat Removal (RHR) Shutdown Cooling System - Hot Shutdown." The technical evaluation of each change follows.

##### 3.1.1 Evaluation of Changes to Condition A

The licensee proposed to add a recurring CT to current Required Action A.2 of "once per 24 hours thereafter." Current Required Action A.2 requires verification that an alternate method of decay heat removal is available for each inoperable RHR shutdown cooling subsystem within 1 hour. The NRC staff finds this change is acceptable, since it requires continuous verification of alternate methods of decay heat removal every 24 hours and provides assurance of continued heat removal capability.

The licensee also proposed to delete current Required Action A.3, which requires the plant to be in Mode 4 within 24 hours when one or two RHR shutdown cooling subsystems are inoperable. Current Required Action A.3 requires operators to reduce the reactor coolant system temperature to the point where Mode 4 is entered, due to the potentially reduced reliability of the alternate methods of decay heat removal. However, if there is no operable RHR shutdown cooling subsystem and the plant is in a period of high decay heat load, it may not be possible to reduce the reactor coolant system temperature to the Mode 4 entry condition (typically less than 200 °F) within the CT. In addition, in a typical BWR design, the RHR shutdown cooling system has a heat rejection capability many times greater than alternate methods available. Therefore, for periods in which there is high decay heat load, the BWR design does not include any system which can satisfy Required Action A.3. The NRC staff finds the deletion of current Required Action A.3 is acceptable because, at below the RHR cut in permissive pressure, the remaining required action will continue to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

Current Required Action A.2 is renumbered as A.1, since Required Actions A.1 and A.3 are removed from Condition A. The NRC staff finds this change is acceptable since it provides the correct number sequence.

##### 3.1.2 Evaluation of New Condition B

The licensee proposed a new Condition B for when required action and associated CT of Condition A is not met. New Condition B's required action, B.1, is moved from current Required Action A.1 and requires operators to initiate action to restore RHR shutdown cooling subsystem(s) to operable status immediately. The NRC staff finds that relocating the required action from A.1 to new Required Action B.1 is acceptable because other ways of removing decay heat are available, such as natural circulation, the spent fuel pool cooling system, the reactor water cleanup system and an inoperable, but functional, RHR shutdown cooling subsystem.

If an alternate method cannot be established (Condition A), new Condition B requires the licensee to immediately initiate action to restore the inoperable RHR shutdown cooling subsystem(s) to operable status. The CT "immediately" is defined in Section 1.3 of the [Name

1 **of facility]**'s TSs as, "the Required Action should be pursued without delay and in a controlled  
2 manner." New Required Action B.1 continues to apply until the inoperable RHR shutdown  
3 cooling subsystems are restored to operable status, an alternate decay heat removal method is  
4 established, or the specification is exited.

5  
6 The NRC staff finds this change is acceptable because new Condition B, with its Required  
7 Action B.1, provides an appropriate terminal action for when an alternate method cannot be  
8 established within the CT. In addition, new Required Action B.1 will restore redundant decay  
9 heat removal paths and the immediate CT reflects the importance of maintaining the availability  
10 of two paths for heat removal.

### 11 12 3.1.3 Evaluation of Changes to Existing Condition B

13  
14 Current Required Action A.2 was renumbered as A.1, since Required Actions A.1 and A.3 were  
15 deleted. Current Condition B and its required actions were renamed "C," "C.1," "C.2," and "C.3,"  
16 respectively, since new Condition B was added. The NRC staff finds this change is acceptable  
17 since it provides the correct number sequence.

### 18 19 3.1.4 Conclusion of Proposed Changes to "Residual Heat Removal (RHR) 20 Shutdown Cooling System – Hot Shutdown"

21  
22 The NRC staff concludes the proposed changes are acceptable since the TS continue to meet  
23 the requirements of 10 CFR 50.40(a) because it provides reasonable assurance that the health  
24 and safety of the public will not be endangered.

## 25 26 3.2 PROPOSED CHANGES TO "RESIDUAL HEAT REMOVAL (RHR) 27 SHUTDOWN COOLING SYSTEM – COLD SHUTDOWN"

28  
29 The licensee proposed to modify TS [3.4.9], "Residual Heat Removal (RHR) Shutdown Cooling  
30 System – Cold Shutdown." The technical evaluation of each change follows.

### 31 32 3.2.1 Evaluation of New Condition B

33  
34 The licensee proposed a new Condition B for when the required action and associated CT of  
35 Condition A is not met which has a required action (new Required Action B.1) for operators to  
36 initiate action to restore RHR shutdown cooling subsystems(s) to operable status immediately.

37  
38 If an alternate method cannot be established (Condition A), new Condition B requires the  
39 licensee to immediately initiate action to restore the inoperable RHR shutdown cooling  
40 subsystem(s) to operable status. The CT "immediately" is defined in Section 1.3 of the TSs as,  
41 "the Required Action should be pursued without delay and in a controlled manner." New  
42 Required Action B.1 continues to apply until the inoperable RHR shutdown cooling subsystems  
43 are restored to operable status, an alternate decay heat removal method is established, or the  
44 specification is exited.

45  
46 The NRC staff finds this change is acceptable because new Condition B with its Required  
47 Action B.1 provide an appropriate terminal action for when an alternate method cannot be  
48 established within the CT. In addition, new Required Action B.1 will restore redundant decay  
49 heat removal paths and the immediate CT reflects the importance of maintaining the availability  
50 of two paths for heat removal.

3.2.2 Evaluation of Changes to Existing Condition B

Current Condition B and its required actions were renamed "C," "C.1," and "C.2," respectively, since new Condition B was added. The NRC staff finds this change is acceptable since it provides the correct number sequence.

3.2.3 Conclusion of Proposed Changes to "Residual Heat Removal (RHR) Shutdown Cooling System – Cold Shutdown"

The NRC staff concludes the proposed changes are acceptable since the TS continues to meet the requirements of 10 CFR 50.40(a) because it provides reasonable assurance that the health and safety of the public will not be endangered.

**[3.3 VARIATIONS FROM TSTF-566**

The licensee described variations from TSTF-566 in Section 2.2 of the LAR. The licensee provided justification for the proposed variations and exceptions. The staff reviewed the justifications and concluded the variations are [not] acceptable because....

The [Name of facility's] TSs utilize different [numbering][and][titles] than the Standard Technical Specifications on which TSTF-566 was based. The NRC staff agrees these differences are editorial and do not affect the applicability of TSTF-566 to the proposed LAR.]

**4.0 STATE CONSULTATION**

*{This section is to be prepared by the plant project manager.}*

In accordance with the Commission's regulations, the [Name of State] State official was notified of the proposed issuance of the amendment(s) on [date]. The State official had [no] comments. [If comments were provided, they should be addressed here.]

**5.0 ENVIRONMENTAL CONSIDERATION**

*{This section is to be prepared by the plant project manager in accordance with current procedures.}*

**6.0 CONCLUSION**

*{This section is to be prepared by the plant project manager.}*

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

1   **7.0   REFERENCES**

2  
3   *{Optional section to be prepared by the PM and primary reviewers. If document is publicly*  
4   *available, the ADAMS Accession No. should be listed.}*

5  
6   *{NOTE: These are the principal contributors for the model SE of the traveler. Replace these*  
7   *names with those who prepared the plant-specific SE.}*

8  
9   Principal Contributors: C. Tilton, NRR/DSS  
10                               M. Razzaque, NRR/DSS

11  
12   Date: