



10 CFR 50.90

LR-N18-0061
LAR H17-06

JUN 27 2018

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

Hope Creek Generating Station
Renewed Facility Operating License No. NPF-57
NRC Docket No. 50-354

Subject: Response to Request for Additional Information, Re: Application to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control"

- References:
1. PSEG letter to NRC, "Application to Revise Technical Specifications to Adopt TSTF-542, 'Reactor Pressure Vessel Water Inventory Control,' " dated September 21, 2017 (ADAMS Accession No. ML17265A847)
 2. NRC email to PSEG, "Hope Creek - Final RAI RE: Revise TS to Adopt TSTF-542," (EPID: L-2017-LLA-0352) dated May 30, 2018 (ADAMS Accession No. ML18150A691)

In the Reference 1 letter, PSEG Nuclear LLC (PSEG) submitted a license amendment request for Hope Creek Generating Station. The proposed amendment would revise Technical Specifications to adopt TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control." In Reference 2, the Nuclear Regulatory Commission (NRC) requested PSEG to provide additional information in order to evaluate the proposed License Amendment Request to revise Technical Specifications. The NRC email requested a response by June 29, 2018.

Attachment 1 to this letter provides a restatement of the RAI questions followed by our responses. Attachment 2 provides revised TS markups. Attachment 3 provides revised camera-ready TS pages. Attachments 2 and 3 also include a revised INSERT 3 from Reference 1 which contains a typographical error correction (period missing at the end of 4.5.2.7). The remaining TS markups and camera-ready TS pages remain unaffected by this response. PSEG has determined that the information provided in this submittal does not alter the conclusions reached in the 10 CFR 50.92 no significant hazards determination previously submitted. In addition, the information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no regulatory commitments contained in this letter.

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In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), PSEG is providing a copy of this response, with attachments, to the designated State of New Jersey Official.

Should you have any questions regarding this submittal, please contact Mr. Lee Marabella at 856-339-1208.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 6/26/18
(Date)

Sincerely,



Eric Carr
Site Vice President
Hope Creek Generating Station

Attachments:

1. Response to Request for Additional Information - Application to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control," Revision 2
2. Revised Markup of Proposed Technical Specifications Pages
3. Revised Camera-ready Technical Specification Pages

cc: Administrator, Region I, NRC
Mr. J. Kim, Project Manager, NRC
NRC Senior Resident Inspector, Hope Creek
Mr. P. Mulligan, Chief, NJBNE
Hope Creek Commitment Tracking Coordinator
Corporate Commitment Tracking Coordinator

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Attachment 1

Response to Request for Additional Information - Application to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control," Revision 2

By letter dated September 21, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17265A847) (Reference 1), PSEG Nuclear (PSEG), requested approval to adopt Technical Specifications Task Force (TSTF) Traveler TSTF-542, "Reactor Pressure Vessel Water Inventory Control," Revision 2, which changes the Technical Specifications (TSs) for Hope Creek Generating Station (Hope Creek).

The NRC staff reviewed the information provided that supports the proposed amendment and identified the need for additional information in order to complete their evaluation of the amendment request. The request for additional information (RAI) was sent from the NRC to PSEG by electronic mail message on May 30, 2018 (Reference 2). Below is a restatement of the questions followed by our responses.

Question 1 (HC-RAI-1)

Background:

LAR Attachment 1, page 7, item D.1 describes a variation related to Core Alterations. The variation states:

In alignment with TSTF-542, Rev. 2, Proposed Safety Basis (Section 3.1.2), the existing Hope Creek TS 3.5.2 requirement to suspend core alterations as an action for ECCS inoperability is no longer warranted since there are no postulated events associated with core alterations that are prevented or mitigated by the proposed RPV water inventory control requirements. In addition, loss of RPV inventory events are not initiated by core alteration operations. Refueling Limiting Conditions for Operation (LCOs) 3.9.1, Reactor Mode Switch, 3.9.2, Instrumentation, 3.9.3, Control Rod Position, and 3.9.8, Water Level - Reactor Vessel, provide requirements to ensure safe operation during core alterations, including required water level above the RPV flange. Therefore, PSEG proposes to delete TS 3.5.2, Action 'b' in its entirety, including the action relating to core alterations.

Traveler 542 does not specifically address that existing TS that have in place requirement for CORE ALTERATION, can be deleted.

Question:

Re-instate the TS requirement for CORE ALTERATION as describe in the following sections; LCO 3.5.2, Action b, LCO 3.5.3, Action b, or provide stronger justification that these actions can be deleted.

Response:

The TS requirement for suspending CORE ALTERATIONS has been re-instated by adding it into the newly proposed LCO 3.5.2, Action a, which now states, based on this response:

"With none of the above low pressure ECCS subsystems OPERABLE, immediately suspend CORE ALTERATIONS and restore a subsystem to OPERABLE status within 4 hours. Otherwise, immediately initiate action to establish a method of water injection capable of operating without offsite electrical power."

As noted in Section 2.2 of the original submittal (Reference 1), the requirements of LCO 3.5.3.b are addressed in newly proposed TS LCO 3.5.2 and its associated surveillance requirements. Existing LCO 3.5.3, Action b is captured by adding the immediate suspension of CORE ALTERATIONS into the newly proposed LCO 3.5.2, Action a. In addition, the requirement to establish secondary containment in both LCO 3.5.2, Action b and LCO 3.5.3, Action b is captured by the newly proposed LCO 3.5.2, Actions c. and d. Therefore, no changes are proposed to the previously proposed revisions to LCO 3.5.3 and associated Actions. See revised TS markups (Attachment 2).

Question 2 (HC-RAI-2)

Background:

In LAR Attachment 2, proposed TS Table 3.3.12-2, “RPV Water Inventory Control Instrumentation Setpoints” (TS Page 3/4 3-114), Function 1.a, “Core Spray System, Reactor Vessel Pressure – Low (Permissive)” has a trip setpoint of “ ≤ 461 psig” and Function 2.a, “Low Pressure Coolant Injection Mode of RHR System, Reactor Vessel Pressure – Low (Permissive),” has a trip setpoint of “ ≤ 450 psig”. The proposed change varies from the origin of these TS requirements, existing Table 3.3.3-2, “Emergency Core Cooling System Actuation Instrumentation Setpoints,” Functions 1.c with trip setpoint “461 psig” and Function 2.a, with trip setpoint “450 psig”.

Question:

Please provide technical justification for the proposed trip setpoints for TS Table 3.3.12-2 Functions 1.a and 2.a.

Response:

PSEG is deleting the TRIP SETPOINT column of proposed Table 3.3.12-2 which better aligns with the associated TSTF-542 Table 3.3.5.2-1. In addition, the “*” footnote referring to TS Bases Figure B 3/4.3-1 showing vessel trip setpoint levels, which will no longer be applicable, is also being deleted. A typographical error is also being corrected for the TRIP FUNCTION 3.a ALLOWABLE VALUE making it ≥ 11 inches which corresponds to the value in existing TS Table 3.3.2-2 TRIP FUNCTION 7.a. See revised TS markups (Attachment 2).

Question 3 (HC-RAI-3)

Background:

In LAR Attachment 2, Table 3.3.12-1, “RPV Water Inventory Control Instrumentation” (TS Page 3/4 3-112), Function 3.a, “RHR System Shutdown Cooling Mode of RHR System, Reactor Vessel Water Level – Low, Level 3,” and Function 4.a, “Reactor Water Cleanup System Isolation, Reactor Vessel Water Level – Low Low, Level 2” each has a value of “2” for their minimum operable channels per trip function. The proposed change varies from the origin of these TS requirements, existing Table 3.3.2-1, “Isolation Actuation Instrumentation,” Functions 7.a and 4.f, respectively. Each function currently has a value of “2/Valve” minimum operable channels per trip system. Additionally, in the existing Table 3.3.2-1, both functions contain

footnote (e), which states, "Sensors arranged per valve group, not per trip system."

Question:

Please provide technical justification for the proposed "minimum operable channels per trip function" for TS Table 3.3.12-1 Functions 3.a and 4.a.

Response:

PSEG is restoring the minimum operable channels per trip function to "2/Valve" in proposed Table 3.3.12-1 for Function 3.a, "RHR System Shutdown Cooling Mode of RHR System, Reactor Vessel Water Level – Low, Level 3," and Function 4.a, "Reactor Water Cleanup System Isolation, Reactor Vessel Water Level – Low Low, Level 2." This corresponds with the values in the existing Table 3.3.2-1, "Isolation Actuation Instrumentation," Functions 7.a and 4.f, respectively. Footnote (e) in existing Table 3.3.2-1 provides system design information and does not affect the TS requirements for the isolation actuation trip functions listed. Therefore, a similar footnote is not included in proposed TS Table 3.3.12-1, consistent with NUREG-1433, Rev. 4, and with TSTF-542, Rev. 2. See revised TS markups (Attachment 2).

References:

1. PSEG letter to NRC, "Application to Revise Technical Specifications to Adopt TSTF-542, "Reactor Pressure Vessel Water Inventory Control," dated September 21, 2017 (ADAMS Accession No. ML17265A847).
2. NRC email to PSEG, "Hope Creek - Final RAI RE: Revise TS to Adopt TSTF-542", (EPID: L-2017-LLA-0352) dated May 30, 2018 (ADAMS Accession No. ML18150A691).

Attachment 2

Revised Markup of Proposed Technical Specifications Pages

The following Technical Specification pages for Renewed Facility Operating License NPF-57 are affected by this RAI response:

3/4 3-112

3/4 3-114

3/4 5-6

INSERT 3

TABLE 3.3.12-1
RPV WATER INVENTORY CONTROL INSTRUMENTATION

<u>TRIP FUNCTION</u>	<u>MINIMUM OPERABLE CHANNELS PER TRIP FUNCTION</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTIONS</u>
<u>1. CORE SPRAY SYSTEM</u>			
a. Reactor Vessel Pressure - Low (Permissive)	4/division ^{(a)(c)}	4, 5	83
b. Core Spray Pump Discharge Flow - Low (Bypass)	1/subsystem ^(a)	4, 5	84
c. Manual Initiation	1/subsystem ^(a)	4, 5	84
<u>2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>			
a. Reactor Vessel Pressure-Low (Permissive)	1/valve ^(a)	4, 5	83
b. LPCI Pump Discharge Flow - Low (Bypass)	1/pump ^{(a)(d)}	4, 5	84
c. Manual Initiation	1/subsystem ^(a)	4, 5	84
<u>3. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION</u>			
a. Reactor Vessel Water Level – Low, Level 3	2/Valve	(b)	85
<u>4. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>			
a. Reactor Vessel Water Level - Low Low, Level 2	2/Valve	(b)	85

(a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, “RPV Water Inventory Control.”

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

(c) Division 1 and 2 only.

(d) Function not required to be OPERABLE while associated pump is operating in decay heat removal when minimum flow valve is closed and deactivated.

TABLE 3.3.12-2
RPV WATER INVENTORY CONTROL INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION</u>	<u>ALLOWABLE VALUE</u>
<u>1. CORE SPRAY SYSTEM</u>	
a. Reactor Vessel Pressure - Low (Permissive)	≤ 481 psig
b. Core Spray Pump Discharge Flow - Low (Bypass)	≥ 650 gpm
c. Manual Initiation	N.A.
<u>2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>	
a. Reactor Vessel Pressure-Low (Permissive)	≤ 460 psig
b. LPCI Pump Discharge Flow - Low (Bypass)	≥ 1100 gpm
c. Manual Initiation	N.A.
<u>3. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION</u>	
a. Reactor Vessel Water Level – Low, Level 3	≥ 11 inches
<u>4. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>	
a. Reactor Vessel Water Level - Low Low, Level 2	≥ -45 inches

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

EMERGENCY CORE COOLING SYSTEMS ← (ECCS) AND RPV WATER INVENTORY CONTROL

3/4 5.2 ECCS SHUTDOWN ← RPV WATER INVENTORY CONTROL

LIMITING CONDITION FOR OPERATION

3.5.2 At least ~~two~~ ^{one} of the following shall be OPERABLE: low pressure ECCS subsystems

- a. Core spray system subsystems with a subsystem comprised of:
 - 1. Two OPERABLE core spray pumps, and
 - 2. An OPERABLE flow path capable of taking suction from at least one of the following water sources and transferring the water through the spray sparger to the reactor vessel:
 - a) From the suppression chamber, or
 - b) When the suppression chamber water level is less than the limit or is drained, from the condensate storage tank containing at least 135,000 available gallons of water.
- b. Low pressure coolant injection (LPCI) system subsystems ~~each~~ with a subsystem comprised of:
 - 1. One OPERABLE LPCI pump, and
 - 2. An OPERABLE flow path capable of taking suction from the suppression chamber and transferring the water to the reactor vessel. **

APPLICABILITY: OPERATIONAL CONDITION 4 and 5*.

ACTION:

- a. With ~~one~~ ^{none} of the above required subsystems inoperable, restore at least two ^a subsystems to OPERABLE status within 4 hours or suspend all operations with a potential for draining the reactor vessel. Otherwise, immediately initiate action to establish a method of water injection capable of operating without offsite electrical power.
- b. ~~With both of the above required subsystems inoperable, suspend CORE ALTERATIONS and all operations with a potential for draining the reactor vessel. Restore at least one subsystem to OPERABLE status within 4 hours or establish SECONDARY CONTAINMENT INTEGRITY within the next 8 hours.~~ Deleted

INSERT 2 →

* ~~The ECCS is not required to be OPERABLE provided that the reactor vessel head is removed, the cavity is flooded, the spent fuel pool gates are removed, and water level is maintained within the limits of Specification 3.9.8 and 3.9.9.~~ Deleted

^A ** One LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.

INSERT 3

4.5.2.1 Verify DRAIN TIME \geq 36 hours in accordance with the Surveillance Frequency Control Program.

4.5.2.2 Verify, for a required low pressure coolant injection (LPCI) subsystem, the suppression chamber indicated water level is \geq 5.0 inches in accordance with the Surveillance Frequency Control Program.

4.5.2.3 Verify, for a required Core Spray (CS) subsystem, the Suppression chamber indicated water level is \geq 5.0 inches or condensate storage tank contains at least 135,000 available gallons of water in accordance with the Surveillance Frequency Control Program.

4.5.2.4 Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve in accordance with the Surveillance Frequency Control Program.

4.5.2.5 Verify, for the required ECCS injection/spray subsystem, each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position, in accordance with the Surveillance Frequency Control Program.[#]

4.5.2.6 Operate the required ECCS injection/spray subsystem through the recirculation line for \geq 10 minutes, in accordance with the Surveillance Frequency Control Program.

4.5.2.7 Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal, in accordance with the Surveillance Frequency Control Program.

4.5.2.8 Verify the required ECCS injection/spray subsystem actuates on a manual initiation signal, in accordance with the Surveillance Frequency Control Program.^{##}

Except that an automatic valve capable of automatic return to its ECCS position when an ECCS signal is present may be in position for another mode of operation.

Vessel injection/spray may be excluded.

Attachment 3

Revised Camera-ready Technical Specifications Pages

The following Technical Specification pages for Renewed Facility Operating License NPF-57 are affected by this RAI response:

3/4 3-112

3/4 3-114

3/4 5-6

3/4 5-7

TABLE 3.3.12-1
RPV WATER INVENTORY CONTROL INSTRUMENTATION

<u>TRIP FUNCTION</u>	<u>MINIMUM OPERABLE CHANNELS PER TRIP FUNCTION</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTIONS</u>
<u>1. CORE SPRAY SYSTEM</u>			
a. Reactor Vessel Pressure - Low (Permissive)	4/division ^{(a)(c)}	4, 5	83
b. Core Spray Pump Discharge Flow - Low (Bypass)	1/subsystem ^(a)	4, 5	84
c. Manual Initiation	1/subsystem ^(a)	4, 5	84
<u>2. LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>			
a. Reactor Vessel Pressure-Low (Permissive)	1/valve ^(a)	4, 5	83
b. LPCI Pump Discharge Flow - Low (Bypass)	1/pump ^{(a)(d)}	4, 5	84
c. Manual Initiation	1/subsystem ^(a)	4, 5	84
<u>3. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION</u>			
a. Reactor Vessel Water Level – Low, Level 3	2/Valve	(b)	85
<u>4. REACTOR WATER CLEANUP SYSTEM ISOLATION</u>			
a. Reactor Vessel Water Level - Low Low, Level 2	2/Valve	(b)	85

-
- (a) Associated with an ECCS subsystem required to be OPERABLE by LCO 3.5.2, "RPV Water Inventory Control."
- (b) When automatic isolation of the associated penetration flow path(s) is credited in calculating DRAIN TIME.
- (c) Division 1 and 2 only.
- (d) Function not required to be OPERABLE while associated pump is operating in decay heat removal when minimum flow valve is closed and deactivated.

TABLE 3.3.12-2
RPV WATER INVENTORY CONTROL INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION</u>	<u>ALLOWABLE VALUE</u>
1. <u>CORE SPRAY SYSTEM</u>	
a. Reactor Vessel Pressure - Low (Permissive)	≤ 481 psig
b. Core Spray Pump Discharge Flow - Low (Bypass)	≥ 650 gpm
c. Manual Initiation	N.A.
2. <u>LOW PRESSURE COOLANT INJECTION MODE OF RHR SYSTEM</u>	
a. Reactor Vessel Pressure-Low (Permissive)	≤ 460 psig
b. LPCI Pump Discharge Flow - Low (Bypass)	≥ 1100 gpm
c. Manual Initiation	N.A.
3. <u>RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION</u>	
a. Reactor Vessel Water Level – Low, Level 3	≥ 11 inches
4. <u>REACTOR WATER CLEANUP SYSTEM ISOLATION</u>	
a. Reactor Vessel Water Level - Low Low, Level 2	≥ -45 inches

EMERGENCY CORE COOLING SYSTEMS (ECCS) AND RPV WATER INVENTORY CONTROL

3/4 5.2 RPV WATER INVENTORY CONTROL

LIMITING CONDITION FOR OPERATION

3.5.2 DRAIN TIME of RPV water inventory to the top of active fuel (TAF) shall be \geq 36 hours

AND

At least one of the following low pressure ECCS subsystems shall be OPERABLE:

- a. Core spray system subsystems comprised of:
 1. Two OPERABLE core spray pumps, and
 2. An OPERABLE flow path capable of taking suction from at least one of the following water sources and transferring the water through the spray sparger to the reactor vessel:
 - a) From the suppression chamber, or
 - b) When the suppression chamber water level is less than the limit or is drained, from the condensate storage tank containing at least 135,000 available gallons of water.
- b. Low pressure coolant injection (LPCI) system subsystem comprised of:
 1. One OPERABLE LPCI pump, and
 2. An OPERABLE flow path capable of taking suction from the suppression chamber and transferring the water to the reactor vessel. ^{**}

APPLICABILITY: OPERATIONAL CONDITION 4 and 5.

ACTION:

- a. With none of the above low pressure ECCS subsystems OPERABLE, immediately suspend CORE ALTERATIONS and restore a subsystem to OPERABLE status within 4 hours. Otherwise, immediately initiate action to establish a method of water injection capable of operating without offsite electrical power.
- b. Deleted.

* Deleted.

** A LPCI subsystem may be considered OPERABLE during alignment and operation for decay heat removal if capable of being manually realigned and not otherwise inoperable.

EMERGENCY CORE COOLING SYSTEMS (ECCS) AND RPV WATER INVENTORY CONTROL

SURVEILLANCE REQUIREMENTS

4.5.2.1 Verify DRAIN TIME \geq 36 hours in accordance with the Surveillance Frequency Control Program.

4.5.2.2 Verify, for a required low pressure coolant injection (LPCI) subsystem, the suppression chamber indicated water level is \geq 5.0 inches in accordance with the Surveillance Frequency Control Program.

4.5.2.3 Verify, for a required Core Spray (CS) subsystem, the Suppression chamber indicated water level is \geq 5.0 inches or condensate storage tank contains at least 135,000 available gallons of water in accordance with the Surveillance Frequency Control Program.

4.5.2.4 Verify, for the required ECCS injection/spray subsystem, the piping is filled with water from the pump discharge valve to the injection valve in accordance with the Surveillance Frequency Control Program.

4.5.2.5 Verify, for the required ECCS injection/spray subsystem, each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position, in accordance with the Surveillance Frequency Control Program. #

4.5.2.6 Operate the required ECCS injection/spray subsystem through the recirculation line for \geq 10 minutes, in accordance with the Surveillance Frequency Control Program.

4.5.2.7 Verify each valve credited for automatically isolating a penetration flow path actuates to the isolation position on an actual or simulated isolation signal, in accordance with the Surveillance Frequency Control Program.

4.5.2.8 Verify the required ECCS injection/spray subsystem actuates on a manual initiation signal, in accordance with the Surveillance Frequency Control Program. ##

Except that an automatic valve capable of automatic return to its ECCS position when an ECCS signal is present may be in position for another mode of operation.

Vessel injection/spray may be excluded.