



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

March 12, 2021

Mr. Eric Carr
President and Chief Nuclear Officer
PSEG Nuclear LLC – N09
P.O. Box 236
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION – ISSUANCE OF AMENDMENT
NO. 227 RE: REVISE TECHNICAL SPECIFICATIONS TO ADOPT TSTF-582,
“RPV WIC ENHANCEMENTS” (EPID L-2020-LLA-0220)

Dear Mr. Carr:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 227 to Renewed Facility Operating License No. NPF-57 for the Hope Creek Generating Station in response to your application dated September 29, 2020.

The amendment adopts Technical Specifications Task Force (TSTF) Traveler TSTF–582, “RPV [Reactor Pressure Vessel] WIC [Water Inventory Control] Enhancements.” The technical specifications related to reactor pressure vessel water inventory control are revised to incorporate operating experience and to correct errors and omissions in TSTF–542, Revision 2, “Reactor Pressure Vessel Water Inventory Control.”

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission’s monthly *Federal Register* notice.

Sincerely,

/RA/

James S. Kim, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosures:

1. Amendment No. 227 to
Renewed License No. NPF-57
2. Safety Evaluation
3. Notices and Environmental Findings

cc: Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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PSEG NUCLEAR LLC

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 227
Renewed License No. NPF-57

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by PSEG Nuclear LLC dated September 29, 2020, 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 set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-57 is hereby amended to read as follows:

- (2) Technical Specifications and Environmental Protection Plan

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 227, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. PSEG Nuclear LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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

FOR THE NUCLEAR REGULATORY COMMISSION

James G. Danna, Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: March 12, 2021

ATTACHMENT TO LICENSE AMENDMENT NO. 227

HOPE CREEK GENERATING STATION

RENEWED FACILITY OPERATING LICENSE NO. NPF-57

DOCKET NO. 50-354

Replace the following page of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove

3

Insert

3

Replace the following pages of the Appendix A, Technical Specifications, with the attached revised pages. The revised page are identified by amendment number and contains marginal lines indicating the areas of change.

Remove

1-2a

3/4 3-34

3/4 3-40

3/4 3-111

3/4 3-112

3/4 3-113

3/4 3-114

3/4 3-115

3/4 5-6a

3/4 5-7

3/4 8-11

Insert

1-2a

3/4 3-34

3/4 3-40

3/4 3-111

3/4 3-112

3/4 3-113

3/4 3-114

3/4 3-115

3/4 5-6a

3/4 5-7

3/4 8-11

reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

- (4) PSEG Nuclear LLC, 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) PSEG Nuclear LLC, 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) PSEG Nuclear LLC, 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. Mechanical disassembly of the GE14i isotope test assemblies containing Cobalt-60 is not considered separation.
- (7) PSEG Nuclear LLC, pursuant to the Act and 10 CFR Part 30, to intentionally produce, possess, receive, transfer, and use Cobalt-60.

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

PSEG Nuclear LLC is authorized to operate the facility at reactor core power levels not in excess of 3902 megawatts thermal (100 percent rated power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 227, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the renewed license. PSEG Nuclear LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

DEFINITIONS

DRAIN TIME

1.11.1 The DRAIN TIME is the time it would take for the water inventory in and above the Reactor Pressure Vessel (RPV) to drain to the top of the active fuel (TAF) seated in the RPV assuming:

- a) The water inventory above the TAF is divided by the limiting drain rate;
- b) The limiting drain rate is the larger of the drain rate through a single penetration flow path with the highest flow rate, or the sum of the drain rates through multiple penetration flow paths susceptible to a common mode failure for all penetration flow paths below the TAF except:
 1. Penetration flow paths connected to an intact closed system, or isolated by manual or automatic valves that are closed and administratively controlled in the closed position, blank flanges, or other devices that prevent flow of reactor coolant through the penetration flow paths;
 2. Penetration flow paths capable of being isolated by valves that will close automatically without offsite power prior to the RPV water level being equal to the TAF when actuated by RPV water level isolation instrumentation; or
 3. Penetration flow paths with isolation devices that can be closed prior to the RPV water level being equal to the TAF by a dedicated operator trained in the task, who in continuous communication with the control room, is stationed at the controls, and is capable of closing the penetration flow path isolation device without offsite power.
- c) The penetration flow paths required to be evaluated per paragraph b) are assumed to open instantaneously and are not subsequently isolated, and no water is assumed to be subsequently added to the RPV water inventory;
- d) No additional draining events occur; and
- e) Realistic cross-sectional areas and drain rates are used.

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

Ē-AVERAGE DISINTEGRATION ENERGY

1.12 \bar{E} shall be the average, weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling, of the sum of the average beta and gamma energies per disintegration, in MeV, for isotopes, with half lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

TABLE 3.3.3-1 (Cont'd)
EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

<u>TRIP FUNCTION</u>		<u>MINIMUM OPERABLE CHANNELS PER TRIP FUNCTION^(a)</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTION</u>	
4 <u>AUTOMATIC DEPRESSURIZATION SYSTEM##</u>					
e. RHR LPCI Mode Pump Discharge Pressure - High (Permissive)		2/pump	1, 2, 3	31	
f. Reactor Vessel Water Level - Low, Level 3 (Permissive)		2	1, 2, 3	31	
g. ADS Drywell Pressure Bypass Timer		4	1, 2, 3	31	
h. ADS Manual Inhibit Switch		2	1, 2, 3	31	
i. Manual Initiation		4	1, 2, 3	33	
	<u>TOTAL NO. OF CHANNELS^(h)</u>	<u>CHANNELS TO TRIP^(h)</u>	<u>MINIMUM CHANNELS OPERABLE^(h)</u>	<u>APPLICABLE OPERATIONAL CONDITIONS</u>	<u>ACTION</u>
5 <u>LOSS OF POWER</u>					
1. 4.16 kv Emergency Bus Under-voltage (Loss of Voltage)	4/bus	2/bus	3/bus	1, 2, 3	36
2. 4.16 kv Emergency Bus Under-voltage (Degraded Voltage)	2/source/bus	2/source/bus	2/source/bus	1, 2, 3	36

- (a) A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one OPERABLE channel in the same trip system is monitoring that parameter.
- (b) Also actuates the associated emergency diesel generators.
- (c) One trip system. Provides signal to HPCI pump suction valve only.
- (d) Provides a signal to trip HPCI pump turbine only.
- (e) In divisions 1 and 2, the two sensors are associated with each pump and valve combination. In divisions 3 and 4, the two sensors are associated with each pump only.
- (f) Division 1 and 2 only.
- (g) In divisions 1 and 2, manual initiation is associated with each pump and valve combination; in divisions 3 and 4, manual initiation is associated with each pump only.
- (h) Each voltage detector is a channel.
- (l) Start time delay is applicable to LPCI Pump C and D only.
- * Deleted.
- ** Deleted
- # Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 200 psig.
- ## Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 100 psig.

TABLE 4.3.3.1-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

<u>TRIP FUNCTION</u>	<u>CHANNEL CHECK</u> ^(a)	<u>CHANNEL FUNCTIONAL TEST</u> ^(a)	<u>CHANNEL CALIBRATION</u> ^(a)	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED</u>
<u>4. AUTOMATIC DEPRESSURIZATION SYSTEM##</u>				
a. Reactor Vessel Water Level – Low Low Low, Level 1				1, 2, 3
b. Drywell Pressure - High				1, 2, 3
c. ADS Timer	NA			1, 2, 3
d. Core Spray Pump Discharge Pressure - High				1, 2, 3
e. RHR LPCI Mode Pump Discharge Pressure – High				1, 2, 3
f. Reactor Vessel Water Level - Low, Level 3				1, 2, 3
g. ADS Drywell Pressure Bypass Timer	NA			1, 2, 3
h. ADS Manual Inhibit Switch	NA		NA	1, 2, 3
i. Manual initiation	NA		NA	1, 2, 3
<u>5. LOSS OF POWER</u>				
a. 4.16 kv Emergency Bus Under-voltage (Loss of Voltage)	NA	NA		1, 2, 3
b. 4.16 kv Emergency Bus Under-voltage (Degraded Voltage)				1, 2, 3

(a) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.

* Deleted.

** Deleted.

Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 200 psig.

Not required to be OPERABLE when reactor steam dome pressure is less than or equal to 100 psig.

INSTRUMENTATION

3/4.3.12 RPV WATER INVENTORY CONTROL INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.12 The RPV Water Inventory Control (WIC) actuation instrumentation channels shown in Table 3.3.12-1 shall be OPERABLE.

APPLICABILITY: As shown in Table 3.3.12-1

ACTION:

- a. With one or more channels inoperable, take the ACTION referenced in Table 3.3.12-1 for the channel immediately.

SURVEILLANCE REQUIREMENTS

4.3.12 Each RPV WIC actuation instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, and CHANNEL FUNCTIONAL TEST at the frequencies shown in Table 4.3.12.1-1.

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>
1. Deleted			
2. Deleted			
3. <u>RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION</u>			
a. Reactor Vessel Water Level – Low, Level 3	2/Valve	(a)	85
4. <u>REACTOR WATER CLEANUP SYSTEM ISOLATION</u>			
a. Reactor Vessel Water Level - Low Low, Level 2	2/Valve	(a)	85

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

TABLE 3.3.12-1 (Continued)

RPV WATER INVENTORY CONTROL INSTRUMENTATION

ACTION

ACTION 83 - Deleted

ACTION 84 - Deleted

ACTION 85 - Immediately initiate action to place the channel in trip, or immediately declare the associated penetration flow path(s) incapable of automatic isolation and initiate action to calculate DRAIN TIME.

TABLE 3.3.12-2
RPV WATER INVENTORY CONTROL INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION</u>	<u>ALLOWABLE VALUE</u>
1. Deleted	
2. Deleted	
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

TABLE 4.3.12.1-1
RPV WATER INVENTORY CONTROL INSTRUMENTATION SURVEILLANCE
REQUIREMENTS

<u>TRIP FUNCTION</u>	<u>CHANNEL CHECK^(a)</u>	<u>CHANNEL FUNCTIONAL TEST^(a)</u>	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED</u>
1. Deleted			
2. Deleted			
3. <u>RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION</u>			
a. Reactor Vessel Water Level – Low, Level 3			(b)
4. <u>REACTOR WATER CLEANUP SYSTEM ISOLATION</u>			
a. Reactor Vessel Water Level - Low Low, Level 2			(b)

(a) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.

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

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

LIMITING CONDITION FOR OPERATION (continued)

ACTION:

- c. With DRAIN TIME < 36 hours and \geq 8 hours, within 4 hours:
1. Verify secondary containment boundary is capable of being established in less than the DRAIN TIME, AND
 2. Verify each secondary containment penetration flow path is capable of being isolated in less than the DRAIN TIME, AND
 3. Verify one Filtration, Recirculation and Ventilation (FRVS) ventilation unit is capable of being placed in operation in less than the DRAIN TIME.

Otherwise, immediately initiate action to restore DRAIN TIME to \geq 36 hours.

- d. With DRAIN TIME < 8 hours and \geq 1 hour, immediately:
1. Initiate action to establish an additional method of water injection with water sources capable of maintaining RPV water level > TAF for \geq 36 hours^{***} AND,
 2. Initiate action to establish secondary containment boundary, AND
 3. Initiate action to isolate each secondary containment penetration flow path or verify it can be automatically or manually isolated from the control room, AND
 4. Initiate action to verify one FRVS ventilation unit is capable of being placed in operation.

Otherwise, immediately initiate action to restore DRAIN TIME to \geq 36 hours.

- e. With DRAIN TIME < 1 hour, immediately initiate action to restore DRAIN TIME to \geq 36 hours.

*** Required ECCS injection/spray subsystem or additional method of water injection shall be capable of operating without offsite electrical power.

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 Deleted

4.5.2.6 Operate the required ECCS injection/spray subsystem 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 can be manually operated, in accordance with the Surveillance Frequency Control Program. ##

Operation may be through the test return line.

Vessel injection/spray may be excluded.

Credit may be taken for normal system operation to satisfy this SR.

ELECTRICAL POWER SYSTEMS

A.C. SOURCES – SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.8.1.2 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. One circuit between the offsite transmission network and the onsite Class 1E distribution system, and
- b. Two diesel generators, one of which shall be diesel generator A or diesel generator B, each with:
 1. A separate fuel oil day tank containing a minimum of 360 gallons of fuel.
 2. A fuel storage system consisting of two storage tanks containing a minimum of 44,800 gallons of fuel.
 3. A separate fuel transfer pump for each storage tank.

APPLICABILITY: OPERATIONAL CONDITIONS 4, 5 and *.

ACTION:

- a. With less than the above required A.C. electrical power sources OPERABLE, suspend CORE ALTERATIONS, handling of recently irradiated fuel in the secondary containment, and crane operations over the spent fuel storage pool when fuel assemblies are stored therein. In addition, when in OPERATIONAL CONDITION 5 with the water level less than 22'-2" above the reactor pressure vessel flange, immediately initiate corrective action to restore the required power sources to OPERABLE status as soon as practical.
- b. The provisions of Specification 3.0.3 are not applicable.
- c. With one fuel oil transfer pump inoperable, realign the flowpath of the affected tank to the tank with the remaining operable fuel oil transfer pump within 48 hours and restore the inoperable transfer pump to OPERABLE status within 14 days, otherwise declare the affected emergency diesel generator (EDG) inoperable. This variance may be applied to only one EDG at a time.

SURVEILLANCE REQUIREMENTS

4.8.1.2 At least the above required A.C. electrical power sources shall be demonstrated OPERABLE per Surveillance Requirements 4.8.1.1.1, 4.8.1.1.2, and 4.8.1.1.3, except for the requirements of 4.8.1.1.2.a.5, 4.8.1.1.2.g, 4.8.1.1.2.h.4, 4.8.1.1.2.h.5, 4.8.1.1.2.h.6, 4.8.1.1.2.h.7, 4.8.1.1.2.h.11, 4.8.1.1.2.h.13 and 4.8.1.1.2.k.2.

* When handling recently irradiated fuel in the secondary containment.



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO
AMENDMENT NO. 227 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-57
PSEG NUCLEAR LLC
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

<u>Application (i.e., initial and supplements)</u> <ul style="list-style-type: none">September 29, 2020, ADAMS Accession No. ML20274A097	<u>Safety Evaluation Date</u> March 12, 2021
	<u>Principal Contributors to Safety Evaluation</u> <ul style="list-style-type: none">Tarico SweatJosh Wilson

1.0 PROPOSED CHANGES

PSEG Nuclear LLC (the licensee) requested changes to the technical specifications (TSs) for Hope Creek Generating Station (Hope Creek) by license amendment request (LAR, application). In its application, the licensee requested that the U.S. Nuclear Regulatory Commission (NRC, the Commission) process the proposed amendment under the Consolidated Line Item Improvement Process (CLIIP). The proposed changes would revise the TSs related to reactor pressure vessel (RPV) water inventory control (WIC) based on Technical Specifications Task Force (TSTF) Traveler TSTF-582, Revision 0, "RPV WIC Enhancements" (TSTF-582) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19240A260), and the associated NRC staff safety evaluation (SE) of TSTF-582 (ADAMS Accession No. ML20219A333).

The boiling-water reactor (BWR) RPV design includes multiple penetrations located below the top of active fuel (TAF). These penetrations provide entry for control rods, recirculation flow, reactor water cleanup (RWCU), and shutdown cooling. Since these penetrations are below the TAF, this creates a potential to drain the reactor vessel water inventory and lose effective core cooling. The loss of water inventory and effective core cooling can potentially lead to fuel cladding failure and radioactive release. Drain Time is the time it would take for the water inventory in and above the RPV to drain to the TAF.

1.1 Proposed TS Changes to Adopt TSTF-582

In accordance with NRC staff-approved TSTF-582, the licensee proposed changes that would revise the TSs related to RPV WIC to incorporate operating experience and to correct errors and omissions that the licensee incorporated into the Hope Creek TS when adopting TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control" (ADAMS Accession No. ML16074A448). Specifically, the licensee proposed the following changes to adopt TSTF-582:

- The Drain Time definition in TS 1.11.1 would be revised to move the examples of common mode failure mechanisms to the Bases and delete seismic events.
- In TS 1.11.1, Drain Time definition, the exception from considering the Drain Time for penetration flow paths isolated with manual or automatic valves that are "locked, sealed, or otherwise secured" would be revised to apply the exception for manual or automatic valves that are "closed and administratively controlled."
- The Actions of TS 3/4.3.12, Action 85 in Table 3.3.12-1 would be revised to permit placing an inoperable isolation channel in trip as an alternative to declaring the associated penetration flow path incapable of automatic isolation and initiating action to calculate DRAIN TIME.
- TS 3/4.5.2 and TS 3/4.3.12 would be revised to eliminate the requirement for a manual emergency core cooling system (ECCS) initiation signal to start the required ECCS injection/spray subsystem, and to instead rely on manual valve alignment and pump start. TS 4.5.2 surveillance requirements (SRs) related to manual initiation using the ECCS signal (such as verifying automatic alignment of valves on an initiation signal) would be eliminated. Related to this change, the TS 3/4.3.12 functions, SRs, and Actions that only support manual initiation using an ECCS signal (including interlocks and minimum flow instruments) would be eliminated.
- SR 4.5.2.6, that requires operating the required ECCS injection/spray subsystem for at least 10 minutes through the recirculation line, would be modified by the addition of two notes. The first Note would replace the existing SR that the ECCS subsystem be run through the recirculation line with a Note that states that operation may be through the test return line. The second Note would permit crediting normal operation of the low-pressure ECCS subsystem for performance of the SR.

1.2 Additional Proposed TS Changes

1.2.1 Proposed TS Changes to Adopt TSTF-583-T

The licensee proposed to make the following changes in accordance with TSTF-583-T, "TSTF-582 Diesel Generator Variation" (ADAMS Accession No. ML20248H330):

- TS 3.3.3, "Emergency Core Cooling System Actuation Instrumentation," Trip Function 5, "Loss of Power," would be revised to delete the Operational Conditions 4 and 5 applicability, and associated note.

- SR 4.8.1.2 would be revised to add SR 4.8.1.1.2.g, SR 4.8.1.1.2.h.4, SR 4.8.1.1.2.h.5, SR 4.8.1.1.2.h.6, SR 4.8.1.1.2.h.7, SR 4.8.1.1.2.h.11, SR 4.8.1.1.2.h.13, and SR 4.8.1.1.2.k.2 to the list of TS 3/4.8.1.1 SRs that are not applicable under SR 4.8.1.2.

1.2.2 Editorial Variations

Hope Creek TSs are based on the previous version of the NRC's Standard TS (NUREG-0123, Revision 2) and, therefore, the wording and format varies slightly from the NRC Improved Standard Technical Specifications (STS) (NUREG-1433) shown in TSTF-582, Revision 0, and the applicable parts of the NRC's safety evaluation.

Hope Creek uses different numbering and titles than the improved STS in several instances.

2.0 **REGULATORY EVALUATION**

The regulation at 10 CFR 50.36(c)(2) requires that TSs include limiting conditions for operation (LCOs). Per Title 10 *Code of Federal Regulations* (10 CFR) 50.36(c)(2)(i), LCOs "are the lowest functional capability or performance levels of equipment required for safe operation of the facility." The regulation also requires that when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TS until the condition can be met.

The regulation at 10 CFR 50.36(c)(3) requires that TSs include items in the category of SRs, which are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

The NRC staff'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 STSs for each of the LWR nuclear designs. Accordingly, the NRC staff's review includes consideration of whether the proposed changes are consistent with the "Standard Technical Specifications, General Electric, BWR/4 Plants," NUREG-1433, Volume 1, "Specifications," and Volume 2, "Bases," Revision 4.0, dated April 2012 (ADAMS Accession Nos. ML12104A192 and ML12104A193, respectively), as modified by NRC-approved travelers.

Traveler TSTF-582 revised the STSs related to RPV WIC to incorporate operating experience and to correct editorial errors in TSTF-542, Revision 2, "Reactor Pressure Vessel Water Inventory Control" (ADAMS Accession No. ML16074A448). The NRC approved TSTF-542, Revision 2, on December 20, 2016 (ADAMS Package Accession No. ML16343B066). The NRC staff approved TSTF-582 under the CLIIP in its letter dated August 13, 2020 (ADAMS Accession No. ML20219A333). The TSTF-582 SE states that a licensee may adopt the STS changes approved in TSTF-582, if the licensee has already adopted the STS changes approved in TSTF-542.

3.0 TECHNICAL EVALUATION

3.1 Proposed TS Changes to Adopt TSTF-582

The NRC staff compared the licensee's proposed TS changes in Section 1.1 of this SE against the changes approved in TSTF-582. In accordance with the SRP Chapter 16.0, the NRC staff determined that the STS changes approved in TSTF-582 are applicable to Hope Creek TSs because the Hope Creek is a BWR/4, and the NRC staff approved the TSTF-582 changes for BWR/4 designs. The licensee meets the TSTF-582 SE provision for adoption of TSTF-582 since the licensee adopted Traveler TSTF-542 on October 30, 2018 (Accession No. ML18260A203). Therefore, the NRC staff concludes that the licensee's proposed changes to the Hope Creek TSs in Section 1.1 of this SE are acceptable in that they are consistent with TSTF-582 and the terms for use stated in the NRC staff's SE of TSTF-582.

The NRC staff finds that proposed changes to the TS 1.11.1 definition and LCOs 3.3.3, 3.3.12, and 3.5.2 correctly specify the lowest functional capability or performance levels of equipment required for safe operation of the facility in accordance with 10 CFR 50.36(c)(2)(i). Also, the NRC staff finds that proposed changes to the Actions of LCOs 3.3.12 and 3.5.2 are adequate remedial actions to be taken until each LCO can be met provide protection to the health and safety of the public, thereby satisfying 10 CFR 50.36(c)(2)(i).

The NRC staff finds that the proposed revisions to the SRs in TSs 4.3.12, 4.5.2, and 4.8.1.2 continue to provide 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 in accordance with 10 CFR 50.36(c)(3).

Thus, the proposed changes continue to meet the requirements of 10 CFR 50.36(c)(2)(i) and 10 CFR 50.36(c)(3) as discussed in Section 3.0 of the NRC staff's SE of TSTF-582.

3.2 Additional Proposed TS Changes

3.2.1 Proposed TS Changes to Adopt TSTF-583-T

Refer to Section 1.2.1 of this SE for proposed changes.

3.2.1.1 TS 3/4.3.3, Applicability

The licensee stated that TS 3.8.1.2 does not require automatic start and loading of a diesel generator (DG) on an ECCS initiation signal or a loss of offsite power signal. Currently, TS 3/4.3.3, "Emergency Core Cooling System Actuation Instrumentation," Trip Function 5, "Loss of Power," is applicable in Operational Conditions 1, 2, and 3, and in Operational Conditions 4 and 5 when engineered safety features (ESF) equipment is required to be operable. The NRC staff confirmed that TS 3.8.1.2 no longer requires automatic start and loading of a DG on a loss of power (LOP) signal. The NRC staff finds it acceptable to revise the Applicability of LCO 3/4.3.3 Trip Function 5 by deleting "Operational Conditions 4 and 5 when ESF equipment is required to be operable," because the LOP instrumentation that generates the LOP signal does not need to be operable when the DG is required to be operable by TS 3.8.1.2. Therefore, the NRC staff concludes that the LCO applicability changes will continue to provide for the lowest functional capability or performance levels of equipment required for safe operation of the facility and, therefore, meet the LCO requirements of 10 CFR 50.36(c)(2).

3.2.1.2 SR 4.8.1.2

LCO 3.8.1.2, "AC Sources - Shutdown," requires one offsite circuit and two DGs capable of supplying one division of the onsite Class 1E AC electrical power distribution subsystem(s) to be operable in shutdown conditions. The existing SR 4.8.1.2 lists the TS 3/4.8.1 SRs that are applicable in shutdown conditions with some exceptions.

TS SR 4.8.1.1.2.g and SR 4.8.1.1.2.k.2 require that the DG starts from standby or hot conditions, respectively, and achieve required voltage and frequency within 10 seconds and required steady state voltage and frequency ranges. The 10-second start requirement associated with the DG automatic start supports the assumptions in the design basis loss-of-coolant accident analysis. The NRC staff confirmed that 10-second timing is not required during a manual DG start to respond to a draining event, which has a minimum Drain Time of 1 hour. In addition, SR 4.8.1.1.2.a.4, which requires the DG to start from standby conditions and achieve the required steady state voltage and frequency ranges, is applicable under SR 4.8.1.2. The NRC staff finds that the SR 4.8.1.1.2.g and SR 4.8.1.1.2.k.2 testing for the DG's capability to achieve required steady state voltage and frequency ranges will be performed in SR 4.8.1.1.2.a.4 since SR 4.8.1.1.2.a.4 provides the test for this DG capability. Therefore, the NRC staff finds it acceptable to add SR 4.8.1.1.2.g and SR 4.8.1.1.2.k.2 to the list of TS 3.8.1.1 SRs that are not applicable under SR 4.8.1.2.

TS SR 4.8.1.1.2.h.13 states, "Verifying that the automatic load sequence timer is OPERABLE with the interval between each load block within $\pm 10\%$ of its design interval." This SR verifies the 10 percent load sequence time interval tolerance between each sequenced load block when loads are sequentially connected to the ESF bus by an automatic sequencer while the DG is tied to the ESF bus. TS 3.5.2 requires manual starting of the equipment for water injection to respond to a draining event so that the DG will be manually loaded during a draining event. No other postulated events require automatic loading of the DG during shutdown conditions. The NRC staff confirmed that with respect to SR 4.8.1.1.2.h.13, the load sequencer are used for the automatic loading of the DG and are not used during a manual loading of the DG. Therefore, the NRC staff finds it acceptable to add SR 4.8.1.1.2.h.13 to the list of TS 3.8.1.1 SRs that are not applicable under SR 4.8.1.2.

The NRC staff has reviewed the remaining list of TS 3.8.1.1 SRs that are not applicable under SR 4.8.1.2: SRs 4.8.1.1.2.h.4, 4.8.1.1.2.h.5, 4.8.1.1.2.h.6, 4.8.1.1.2.h.7, and 4.8.1.1.2.h.11. The staff confirmed that the SRs proposed to be excluded from SR 4.8.1.2 is acceptable because they verify the ability of the diesel generators to automatically start and load on an ECCS initiation signal or loss of offsite power signal which was eliminated in Operational Conditions 4 and 5 in TSTF 542.

The NRC staff finds that the proposed changes to revise SR 4.8.1.2 are acceptable because the applicable SRs will continue to demonstrate the operability of the required AC power sources and, as such, ensure the availability of the AC power required to operate the plant in a safe manner and mitigate postulated events during shutdown conditions. Therefore, the NRC staff finds the proposed changes to SR 4.8.1.2 are acceptable because the changes continue to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the associated LCO will continue to be met in accordance with 10 CFR 50.36(c)(3).

3.2.2 Editorial

The NRC staff reviewed the editorial variations proposed by the licensee, described in Section 1.2.1 of this SE.

The Hope Creek TSs are based on the previous version of the NRC's Standard TS (NUREG-0123, Revision 2). The NRC staff reviewed the proposed changes against NRC Improved Standard Technical Specifications (NUREG-1433) shown in TSTF-582, Revision 0. The NRC staff finds this variation acceptable because the Hope Creek TSs meet the intent of TSTF-582, Revision 0, and do not substantively change the TS requirements.

The licensee noted that Hope Creek TSs have different numbering and titles than STS for the RPV WIC related TS. The NRC staff finds that the different TS numbering changes are acceptable because they are editorial clarifications and do not substantively change TS requirements.

Finally, the NRC staff reviewed the proposed TS changes for technical clarity and consistency with the existing requirements for customary terminology and formatting. The NRC staff finds that the proposed changes are consistent with Chapter 16.0 of the standard review plan and are therefore acceptable.

4.0 **CONCLUSION**

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

NOTICES AND ENVIRONMENTAL FINDINGS

RELATED TO

AMENDMENT NO. 227 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-57

PSEG NUCLEAR LLC

HOPE CREEK GENERATING STATION

DOCKET NO. 50-354

<u>Application (i.e., initial and supplements)</u> <ul style="list-style-type: none"> • September 29, 2020, ADAMS Accession No. ML20274A097 	<u>Safety Evaluation Date</u> March 12, 2021 <div style="background-color: black; height: 20px; width: 100%;"></div>
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1.0 INTRODUCTION

PSEG Nuclear LLC (the licensee) requested changes to the technical specifications (TSs) for Hope Creek Generating Station by license amendment request (LAR, application). In its application, the licensee requested that the U.S. Nuclear Regulatory Commission (NRC, the Commission) process the proposed amendment under the Consolidated Line Item Improvement Process (CLIP). The proposed changes would revise the technical specifications related to reactor pressure vessel (RPV) water inventory control (WIC) based on Technical Specifications Task Force (TSTF) Traveler TSTF-582, Revision 0, "RPV WIC Enhancements" (henceforth TSTF-582) (ADAMS Accession No. ML19240A260), and the associated NRC staff safety evaluation (SE) of TSTF-582 (ADAMS Accession No. ML20219A333).

2.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersey State official was notified of the proposed issuance of the amendment on February 5, 2021. The State official had no comments.

3.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in Title 10 *Code of Federal Regulations* (10 CFR) Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding December 1, 2020 (85 FR 77274). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

SUBJECT: HOPE CREEK GENERATING STATION – ISSUANCE OF AMENDMENT
NO. 227 RE: REVISE TECHNICAL SPECIFICATIONS TO ADOPT TSTF-582,
“RPV WIC ENHANCEMENTS” (EPID L-2020-LLA-0220) DATED
MARCH 12, 2021

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