



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

November 7, 2019

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. 220 REGARDING REVISE TECHNICAL SPECIFICATIONS TO ADOPT
TSTF-546, "REVISE APRM [AVERAGE POWER RANGE MONITOR] CHANNEL
ADJUSTMENT SURVEILLANCE REQUIREMENT" (EPID L-2019-LLA-0032)

Dear Mr. Carr:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 220 to Renewed Facility Operating License No. NPF-57 for the Hope Creek Generating Station in response to your application dated February 27, 2019.

The amendment adopts Technical Specifications Task Force (TSTF) Traveler TSTF-546, "Revise APRM [Average Power Range Monitor] Channel Adjustment Surveillance Requirement," which revises the Hope Creek Generating Station technical specification surveillance requirement to verify that calculated power is no more than 2 percent greater than the APRM channel output. This change revises the surveillance requirement to distinguish between APRM indications that are consistent with the accident analyses and those that provide additional margin.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *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. 220 to
Renewed License No. NPF-57
2. Safety Evaluation

cc: Listserv



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PSEG NUCLEAR LLC

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 220
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 February 27, 2019, 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 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. 220, 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

/RA/

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: November 7, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 220

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 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 pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove
3/4 3-8

Insert
3/4 3-8

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. 220, 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.

Renewed License No. NPF-57
Amendment No. 220

TABLE 4.3.1.1-1 (Continued)
REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK ^(m)</u>	<u>CHANNEL FUNCTIONAL TEST ^(m)</u>	<u>CHANNEL CALIBRATION ^(m)</u>	<u>OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED</u>
8. Scram Discharge Volume Water Level - High:				
a. Float Switch	NA			1, 2, 5 ^(j)
b. Level Transmitter/Trip Unit		(k)		1, 2, 5 ^(j)
9. Turbine Stop Valve - Closure	NA			1
10. Turbine Control Valve Fast Closure Valve Trip System Oil Pressure - Low	NA			1
11. Reactor Mode Switch Shutdown Position	NA		NA	1, 2, 3, 4, 5
12. Manual Scram	NA		NA	1, 2, 3, 4, 5

- (a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (b) The IRM and SRM channels shall be determined to overlap for at least 1/2 decades during each startup after entering OPERATIONAL CONDITION 2 and the IRM and APRM channels shall be determined to overlap for at least 1/2 decades during each controlled shutdown, if not performed within the previous 7 days.
- (c) DELETED
- (d) This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER \geq 24% of RATED THERMAL POWER. Adjust the APRM channel if the calculated power exceeds the APRM output by greater than 2% of RATED THERMAL POWER.
- (e) The CHANNEL FUNCTIONAL TEST includes the recirculation flow input function, excluding the flow transmitters.
- (f) The LPRMs shall be calibrated in accordance with the Surveillance Frequency Control Program.
- (g) Calibration includes the flow input function.
- (h) Deleted.
- (i) This item intentionally blank
- (j) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
- (k) Verify the trip setpoint of the trip unit in accordance with the Surveillance Frequency Control Program.
- (l) Not required to be performed when entering OPERATIONAL CONDITION 2 from OPERATIONAL CONDITION 1 until 12 hours after entering OPERATIONAL CONDITION 2.
- (m) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 220

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-57

PSEG NUCLEAR LLC

HOPE CREEK GENERATING STATION

DOCKET NO. 50-354

1.0 INTRODUCTION

By letter dated February 27, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19058A221), PSEG Nuclear LLC (the licensee) requested changes to the Hope Creek Generating Station Technical Specifications (TSs). Specifically, the licensee requested changes to the TSs to adopt Technical Specifications Task Force (TSTF) Traveler TSTF-546, Revision 0, "Revise APRM [Average Power Range Monitor] Channel Adjustment Surveillance Requirement," dated April 21, 2016 (ADAMS Accession No. ML16112A208). The NRC approved the traveler on August 31, 2017 (ADAMS Accession No. ML17206A431).

The proposed changes would revise a surveillance requirement (SR) to only require adjustment of the APRM channels if the calculated power exceeds the APRM output by more than 2 percent rated thermal power (RTP).

2.0 REGULATORY EVALUATION

2.1 System Description

The APRMs monitor neutron flux within the core to provide an indication of core power. The APRM channels receive input signals from the local power range monitors (LPRM) within the reactor core to provide an indication of the power distribution and local power changes. The APRM channels average these LPRM signals to provide a continuous indication of average reactor power from a few percent to greater than RTP.

The APRM system is a safety-related system with two purposes. One purpose is to monitor the core thermal power level. The other purpose is to provide reactor scram and control rod block signals to preserve the fuel cladding integrity. The APRM system consists of a number of APRM channels that each receive input signals from LPRMs located in the reactor core. The APRM channels average the LPRM inputs and because the LPRMs assigned to specific APRM channels are located in diverse axial and radial locations throughout the reactor core, each APRM provides a continuous indication of average reactor power. A gain adjustment can be made to each APRM channel output allowing it to be calibrated to the calculated core thermal

power. The typical allowable absolute difference between calculated core thermal power and the APRM channel output is 2 percent.

2.2 Proposed Technical Specification Changes

The proposed changes would revise SR 4.3.1.1, specifically TS Table 4.3.1.1-1, "Reactor Protection System Instrumentation Surveillance Requirements," note (d).

TS Table 4.3.1.1-1, note (d) currently states the following:

This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER \geq 24% of RATED THERMAL POWER. Adjust the APRM channel if the absolute difference is greater than 2% of RATED THERMAL POWER.

The proposed TS Table 4.3.1.1-1, note (d) would state the following:

This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER \geq 24% of RATED THERMAL POWER. Adjust the APRM channel if the calculated power exceeds the APRM output by greater than 2% of RATED THERMAL POWER.

2.3 Regulatory Requirements and Guidance

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

Additionally, 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 categories of items required to be in the TSs are provided in 10 CFR 50.36(c). As required in 10 CFR 50.36(c)(2)(i), the TSs will include limiting conditions for operation (LCOs), which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. Pursuant to 10 CFR 50.36(c)(2)(i), when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

The regulation in 10 CFR 50.36(c)(3), requires TSs to include items in the category of SRs, which are requirements relating to test, calibration, or inspection to assure that the necessary

quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

The NRC staff's guidance for the review of TSs is in Chapter 16, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (SRP), dated March 2010 (ADAMS Accession No. ML100351425).

3.0 TECHNICAL EVALUATION

The existing SR 4.3.1.1, specifically TS Table 4.3.1.1-1 note [d] requires calibration of the APRM channel if the absolute difference between the APRM channels and the calculated power is greater than 2 percent of the RTP when operating ≥ 24 percent thermal power. If the absolute difference is > 2 percent, the APRM channel is declared inoperable. An acceptable way to restore operability is to adjust the gain for the APRM channel to restore the absolute difference to ≤ 2 percent. If the APRM channel is reading higher than the calculated thermal power, a downward adjustment would be non-conservative with respect to the Reactor Protection System (RPS) trip setpoint. If the APRM channel is reading lower than the calculated thermal power, an upward adjustment would be conservative with respect to the RPS trip setpoint.

The proposed change would require adjustment of the APRM channel only if the APRM is non-conservative with respect to calculated thermal power (i.e., reading lower than calculated thermal power). Conversely, if the APRM channel is reading higher than calculated thermal power, adjustment of the APRM channel is permitted, but not required. The proposed change would require adjustment of the APRM channel only if the APRM is reading lower than calculated thermal power by more than 2 percent. If the APRM indication is less than calculated thermal power, then the APRMs may fail to initiate a trip signal when the actual reactor power reaches the trip setpoint value. An upward adjustment of the APRM channel to bring it closer to calculated thermal power would, therefore, be conservative.

The NRC staff reviewed the changes proposed to SR 4.3.1.1, specifically TS Table 4.3.1.1-1, note [d] as described in this safety evaluation. The NRC staff determined that the TS 4.3.1.1-1, note [d], as modified, continues to provide appropriate controls and acceptance criteria for adjustment of the APRMs to ensure that the APRMs appropriately reflect actual reactor power. The NRC staff determined that the SR continues to verify the operability of the APRMs and provide assurance that the necessary quality of systems and components is maintained.

3.1 Variations from the Approved Traveler

The licensee is proposing the following two variations from the TS changes described in TSTF-546 and discussed in the NRC staff's safety evaluation of TSTF-546 (ML17206A431). These variations do not affect the applicability of TSTF-546 or the NRC staff's TSTF safety evaluation to the proposed license amendment.

The HCGS TS utilize different numbering than the Standard Technical Specifications on which TSTF-546 was based. Specifically, the SR associated with RPS Instrumentation is governed by SR 4.3.1.1 and the SR requirements for specific RPS instruments are delineated in TS Table 4.3.1.1-1, Reactor Protection System Instrumentation Surveillance Requirements. TS Table 4.3.1.1-1 identifies the applicable SRs for Functional Unit 2.b (APRM Simulated Thermal Power-Upscale) and Functional Unit 2.c (APRM Neutron

Flux - Upscale). Note 'd', which is uniquely associated with these two Functional Units, describes the requirements for calibration of the APRMs to conform to a calculated heat balance. These differences are administrative and do not affect the applicability of TSTF-546 to HCGS.

Additionally, TSTF-546 identifies applicability of the subject SR when the reactor is operating at $\geq 25\%$ RTP. HCGS has established a range of $\geq 24\%$ RTP for performance of this SR. The $\geq 24\%$ RTP range of applicability results in earlier performance of the surveillance during reactor startup which is conservative.

The staff reviewed the variations and compared the Hope Creek Generating Station TS format and content to the format and content of the Standard Technical Specifications, as modified by TSTF-546 changes. The staff determined that while the format of the Hope Creek Generating Station TS differ from the format of the Standard Technical Specifications, as modified by TSTF-546 changes, the differences do not affect the applicability of TSTF 546 or the NRC staff's safety evaluation for TSTF-546 to the proposed license amendment. The staff determined that the lower applicability of the SR at Hope Creek Generating Station, ≥ 24 percent RTP compared to ≥ 25 percent RTP in the STS, does not affect the applicability of TSTF-546 or the NRC staff's safety evaluation for TSTF-546 to the proposed license amendment.

3.2 Technical Conclusion

The NRC staff reviewed the proposed changes to the TSs, and determined that they meet the standards for TSs under 10 CFR 50.36(b). The proposed changes to the SR 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, and satisfy 10 CFR 50.36(c)(3). Additionally, the changes to the TSs were reviewed for technical clarity and consistency with customary terminology and format in accordance with SRP Chapter 16.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersey State official was notified of the proposed issuance of the amendment on October 15, 2019. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20, and changes SRs. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (84 FR 14152). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

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

Principal Contributors: C. Cheung
M. Hamm

Date: November 7, 2019

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*by memorandum **by e-mail

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