



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

June 28, 2010

Mr. Thomas Joyce
President and Chief Nuclear Officer
PSEG Nuclear
P.O. Box 236, N09
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE:
RELOCATION OF REACTOR RECIRCULATION SYSTEM MOTOR-
GENERATOR SET SCOOP TUBE STOP SETTINGS SURVEILLANCE
(TAC NO. ME1817)

Dear Mr. Joyce:

The Commission has issued the enclosed Amendment No. 181 to Facility Operating License No. NPF-57 for the Hope Creek Generating Station. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated July 30, 2009.

The amendment relocates the TS surveillance requirement for the reactor recirculation system motor-generator set scoop tube stop settings to the Technical Requirements Manual.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "R B Ennis", is positioned above the typed name.

Richard B. Ennis, Senior Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosures:

1. Amendment No. 181 to
License No. NPF-57
2. Safety Evaluation

cc w/encls: Distribution via Listserv



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

PSEG NUCLEAR LLC

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 181
License No. NPF-57

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by PSEG Nuclear LLC dated July 30, 2009, 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. 181, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into the 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. Implementation shall include the relocation of information from the Technical Specifications to the Technical Requirements Manual as described in the licensee's application dated July 30, 2009.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Harold K. Chernoff", with a long, sweeping horizontal stroke extending to the right.

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the License
and Technical Specifications

Date of Issuance: June 28, 2010

ATTACHMENT TO LICENSE AMENDMENT NO. 181

FACILITY OPERATING LICENSE NO. NPF-57

DOCKET NO. 50-354

Replace the following page of the Facility Operating License with the revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove
3

Insert
3

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove
3/4 4-2a

Insert
3/4 4-2a

- (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.

C. This 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 3840 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. 181, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into the license. PSEG Nuclear LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Inservice Testing of Pumps and Valves (Section 3.9.6, SSER No. 4)*

This License Condition was satisfied as documented in the letter from W. R. Butler (NRC) to C. A. McNeill, Jr. (PSE&G) dated December 7, 1987. Accordingly, this condition has been deleted.

*The parenthetical notation following the title of many license conditions denotes the section of the Safety Evaluation Report and/or its supplements wherein the license condition is discussed.

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS

4.4.1.1.1 With one reactor coolant system recirculation loop not in operation at least once per 12 hours verify that:

- a. Reactor THERMAL POWER is $\leq 60.86\%$ of RATED THERMAL POWER, and
- b. The recirculation flow control system is in the Local Manual mode, and
- c. The speed of the operating recirculation pump is less than or equal to 90% of rated pump speed.

4.4.1.1.2 With one reactor coolant system recirculation loop not in operation, within no more than 15 minutes prior to either THERMAL POWER increase or recirculation loop flow increase, verify that the following differential temperature requirements are met if THERMAL POWER is $\leq 38\%$ of RATED THERMAL POWER or the recirculation loop flow in the operating recirculation loop is $\leq 50\%$ of rated loop flow:

- a. $\leq 145^{\circ}\text{F}$ between reactor vessel steam space coolant and bottom head drain line coolant, and
- b. $\leq 50^{\circ}\text{F}$ between the reactor coolant within the loop not in operation and the coolant in the reactor pressure vessel, and
- c. $\leq 50^{\circ}\text{F}$ between the reactor coolant within the loop not in operation and the operating loop.

The differential temperature requirements of Specifications 4.4.1.1.2b and 4.4.1.1.2c do not apply when the loop not in operation is isolated from the reactor pressure vessel.

4.4.1.1.3 DELETED.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 181 TO FACILITY OPERATING LICENSE NO. NPF-57
PSEG NUCLEAR LLC
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

1.0 INTRODUCTION

By letter dated July 30, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092230345), PSEG Nuclear LLC (PSEG or the licensee) submitted a license amendment request for Hope Creek Generating Station (HCGS). The proposed amendment would relocate Technical Specification (TS) surveillance requirement (SR) for the reactor recirculation system motor-generator (MG) set scoop tube stop settings to the HCGS Technical Requirements Manual (TRM). Specifically, the proposed amendment would relocate TS SR 4.4.1.1.3 to the TRM which is a licensee-controlled document. SR 4.4.1.1.3 requires that each MG set scoop tube mechanical and electrical stop be demonstrated operable with overspeed setpoints less than or equal to 109% and 107%, respectively, of rated core flow, at least once per 18 months.

2.0 REGULATORY EVALUATION

2.1 Current TS Requirements and Equipment Description

The reactor recirculation system is discussed in HCGS Updated Final Safety Analysis Report (UFSAR) Sections 5.1.7, 5.4.1, and 7.7.1.2. The system provides coolant flow through the core. Adjustment of the core coolant flow rate changes reactor power output, providing a means of following plant load demand without adjusting control rods. The recirculation system consists of two loops, each loop containing one high capacity variable speed motor-driven recirculation pump.

The major components in the recirculation pump MG set consist of a motor, fluid coupler and a generator. The motor drives the generator through the fluid coupler. The speed and output of the generator rise and fall as the volume of fluid in the coupler is varied by changing the position of the scoop tube. As the generator's output increases or decreases, the speed of the recirculation pump follows suit. The scoop tube mechanism has both mechanical and electrical overspeed stops that limit recirculation flow by limiting the MG set speed. The electrical stop actuates first. The mechanical stop is designed to prevent the scoop tube motion if the electrical stop fails or to mitigate overshoot of the electrical stop.

Enclosure

As discussed in the licensee's application dated July 30, 2009, the electrical stop is not credited in any of the accident or transient analyses. However, the mechanical stop setting is an input used in the determination of several of the core operating limits. Specifically, the licensee's application stated that:

The purpose of the mechanical stops is to limit the maximum core flow achievable due to a postulated reactor recirculation dual pump slow flow run out transient which is not terminated by a reactor scram. SR 4.4.1.1.3 ensures that the maximum possible core flow is less than or equal to the maximum core flow assumed for the establishment of the flow dependent Minimum Critical Power Ratio (MCPR) and the flow dependent Linear Heat Generation Rate (LHGR) or Average Planar Linear Heat Generation Rate (APLHGR) Operating Limits (either LHGR or APLHGR may be used to provide protection for the fuel thermal mechanical limits). This event stabilizes at a new core power level corresponding to the maximum possible core flow which is dictated by the MG set scoop tube mechanical stop. The flow dependent MCPR and LHGR or APLHGR Operating Limits are established to protect the fuel cladding by considering the reactor power increase which would result from a postulated increase in recirculation flow to the maximum core flow allowable by the mechanical stops due to a dual pump run out. The flow dependent MCPR and LHGR or APLHGR Operating Limits are established with consideration of this event such that the MCPR Safety Limit or fuel thermal mechanical limits are not violated.

The licensee's application also stated that:

Thus, although the verification of scoop tube stop setting is located in the Reactor Coolant System section of the TS, it is more correctly associated with the requirements for the MCPR and the LHGR or APLHGR Operating Limits.

The MCPR and LHGR or APLHGR operating limits are established and documented on a cycle-specific basis in the core operating limits report (COLR) in accordance with TS 6.9.1.9. Operation within the MCPR, LGHR and APLHGR operating limits is required in accordance with TSs 3.2.3, 3.2.4, and 3.2.1, respectively.

2.2 Regulatory Discussion

The Nuclear Regulatory Commission's (NRC's or the Commission's) regulatory requirements related to the content of the TSs are set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical specifications." This regulation requires that the TSs include items in the following five specific categories: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) SRs; (4) design features; and (5) administrative controls. The regulation does not specify the particular requirements to be included in a plant's TSs.

With respect to SRs, 10 CFR 50.36(c)(3) states that:

Surveillance requirements 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 limiting conditions for operation will be met.

The proposed amendment would relocate SR 4.4.1.1.3 to the HCGS TRM. The TRM is described in Section 13.5, "Plant Procedures," of the HCGS UFSAR. Specifically, UFSAR Section 13.5.4 reads as follows:

13.5.4 Technical Requirements Manual (TRM)

The Technical Requirements Manual (TRM[]) contains technical requirements and/or supporting information (e.g., tables and component lists) which were once contained in the HCGS Technical Specifications (TS) (i.e., Appendix A of the HCGS Facility Operating License). Removal of the TS and information is approved by the NRC through individual TS amendments. The TRM is intended to provide operational guidance and requirements for various plant conditions, actions, and testing similar to TS, however, these requirements are in accordance with licensing commitments. These changes add the TRM into the scope of procedures to be processed through the Station Qualified Reviewer (SQR) process and reviewed by PORC [Plant Operations Review Committee]. Future changes to the relocated requirements and supporting information are processed in accordance with the Quality Assurance Topical Report (QATR), and are subject to 10CFR50.59 review. All non-editorial changes are reviewed by PORC.

The TRM is comprised of an index, the individual specification[s] and bases. The manual is intended to provide a single location for the relocated TS items as a convenience for operations and other station personnel. The individual sections of the TRM contain the relocated licensing commitments, which are subject to the provisions of 10CFR50.59 described above, and are controlled in accordance with the applicable established procedure process.

Nuclear Energy Institute (NEI) guidance document NEI 98-03, Revision 1, "Guidelines for Updating Final Safety Analysis Reports" (ADAMS Accession No. ML003779028) lists the following methods of controlling the TRM on page 7 of Appendix A:

The TRM or other licensee controlled document is explicitly "incorporated by reference" into the UFSAR. Under this approach, the referenced document is subject to the change control requirements of 10 CFR 50.59 and the update/reporting requirements of 10 CFR 50.71(e), e.g., periodic submittal of change pages, etc.

The TRM or other licensee controlled document is treated in a manner consistent with procedures fully or partially described in the UFSAR. Under this approach, the referenced document is maintained on-site in accordance with licensee administrative processes, and changes are evaluated using 10 CFR 50.59.

Regulatory Guide (RG) 1.181, "Content of the Updated Final Safety Analysis Report in Accordance with 10 CFR 50.71(e)" dated September 1999 (ADAMS Accession No. ML992930009), states that Revision 1 of NEI 98-03 provides methods that are acceptable to the NRC staff for complying with the provisions of 10 CFR 50.71(e).

Based on the description in HCGS UFSAR Section 13.5.4, the HCGS TRM is treated in a manner consistent with procedures fully or partially described in the UFSAR. After the information in SR 4.4.1.1.3 is relocated to the TRM, any future changes to the MG set scoop tube mechanical and electrical stop settings would be controlled by the provisions in 10 CFR 50.59.

3.0 TECHNICAL EVALUATION

The proposed amendment would relocate TS SR 4.4.1.1.3 to the TRM. This SR is part of TS 3/4.4.1 which pertains to the reactor coolant system recirculation loops. HCGS TS LCO 3.4.1.1 requires that two reactor coolant system recirculation loops be in operation in Operational Conditions 1 and 2. Two recirculation loops are required to be in operation to ensure that during a loss-of-coolant accident (LOCA) caused by a break of the piping of one recirculation loop, the assumptions of the LOCA analysis are satisfied. With only one recirculation loop in operation, continued plant operation is allowed if the required actions specified in the LCO Action Statement are taken. These actions include placing the recirculation flow control system in manual control mode, limiting the speed of the operating recirculation pump to 90% of rated pump speed, and modifying the MCPR Safety Limit, APLHGR limit, and LHGR limit. These actions, as well as others specified in the LCO, are required to satisfy the assumptions discussed in Appendix 15C, "Hope Creek Single Loop Operation Analysis," of the HCGS UFSAR.

The SR proposed for relocation to the TRM, SR 4.4.1.1.3, requires that each MG set scoop tube mechanical and electrical stop be demonstrated operable with overspeed setpoints less than or equal to 109% and 107%, respectively, of rated core flow, at least once per 18 months. As discussed above, the electrical stop is not credited in any of the accident or transient analyses. However, the mechanical stop setting limits the consequence of a recirculation flow increase event (UFSAR Section 15.4.5). Specifically, the mechanical stop limits the maximum core flow achievable due to a postulated reactor recirculation dual pump slow flow run out transient which is not terminated by a reactor scram. Based on a review of the UFSAR and the TSs, the NRC staff finds that the function performed by the mechanical stop related to the recirculation flow increase event is not associated with the operability requirements for the reactor coolant system recirculation loops as specified in TS 3/4.4.1. As such, the staff concludes that SR 4.4.1.1.3 is not necessary to ensure that LCO 3.4.1.1 will be met. As discussed above, the licensee proposes to relocate SR 4.4.1.1.3 to the HCGS TRM. Based on the description of the TRM in UFSAR Section 13.5.4, future changes to relocated TS requirements will be subject to the provisions of 10 CFR 50.59. As such, the NRC staff finds that there is reasonable assurance that future changes to the relocated requirements will be made in a manner that continues to protect public health and safety.

The mechanical stop setting (i.e., 109% of rated core flow) is used as an input to determine the flow-dependent MCPR and LHGR or APLHGR operating limits. In accordance with TS 6.9.1.9, "Core Operating Limits Report," these limits are required to be established and documented in the COLR before each reload cycle. Operation within these operating limits is required in accordance with TS 3/4.2.1, "Average Planar Linear Heat Generation Rate," TS 3/4.2.3, "Minimum Critical Power Ratio," and TS 3/4.2.4, "Linear Heat Generation Rate." The requirements in TSs 6.9.1.9, 3/4.2.1, 3/4.2.3, and TS 3/4.2.4, provide reasonable assurance that

the flow-dependent MCPR and LHGR or APLHGR operating limits will set such that facility operation will continue to protect public health and safety.

Based on the above findings, the NRC staff concludes that relocation of SR 4.4.1.1.3 to the HCGS TRM is consistent with 10 CFR 50.36(c)(3) and is acceptable.

PSEG's application dated July 30, 2009, provided proposed changes to the TS Bases to be implemented with the associated TS changes. The TS Bases pages were provided for information only and will be revised in accordance with the HCGS TS Bases Control Program.

The NRC staff also notes that the proposed relocation of the subject SR from the HCGS TSs is consistent with NUREG-1433, Revision 3, "Standard Technical Specifications, General Electric Plants BWR/4," which does not contain any SRs associated with the MG set scoop tube stop settings.

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. The State official had no comments.

5.0 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 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 (74 FR 51333). 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) 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: M. Razzaque
R. Ennis

Date: June 28, 2010

June 28, 2010

Mr. Thomas Joyce
President and Chief Nuclear Officer
PSEG Nuclear
P.O. Box 236, N09
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE:
RELOCATION OF REACTOR RECIRCULATION SYSTEM MOTOR-
GENERATOR SET SCOOP TUBE STOP SETTINGS SURVEILLANCE
(TAC NO. ME1817)

Dear Mr. Joyce:

The Commission has issued the enclosed Amendment No. 181 to Facility Operating License No. NPF-57 for the Hope Creek Generating Station. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated July 30, 2009.

The amendment relocates the TS surveillance requirement for the reactor recirculation system motor-generator set scoop tube stop settings to the Technical Requirements Manual.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/ra/

Richard B. Ennis, Senior Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosures:

1. Amendment No. 181 to
License No. NPF-57
2. Safety Evaluation

DISTRIBUTION

PUBLIC

LPL1-2 R/F

RidsNrrDorlLpl1-2 Resource

RidsNrrLAABaxter Resource

RidsNrrPMHopeCreek Resource

RidsNrrDorlDpr Resource

RidsOgcRp Resource

RidsAcrsAcnw_MailCTR Resource

RidsNrrDirsltsb Resource

RidsRgn1MailCenter Resource

GHill, OIS

MRazzaque, NRR/SRXB

ADAMS Accession No: ML101470972

OFFICE	LPL1-2/PM	LPL1-2/LA	SRXB/BC	ITSB/BC	OGC	LPL1-2/BC
NAME	REnnis	ABaxter	AUlses	RElliott CSchulten for	BHarris (NLO w/comments)	HChernoff (w/comment)
DATE	6/17/10	6/7/10	6/11/10	6/17/10	6/21/10	6/28/10