October 20, 2004

Mr. A. Christopher Bakken, III
President & Chief Nuclear Officer
PSEG Nuclear LLC - X15
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE: CHANGE OF FUEL VENDOR AND RELOAD METHODOLOGIES (TAC NO. MC1682)

Dear Mr. Bakken:

The Commission has issued the enclosed Amendment No. 154 to Facility Operating License No. NPF-57 for the Hope Creek Generating Station. This is in response to your letter dated December 24, 2003, as supplemented by letter dated June 8, 2004. The amendment revises the Technical Specifications (TSs) to support the use of GE14 fuel in reload cycle 13. Specifically, the change modifies the TSs to reflect the use of General Electric (GE) core reload analysis methodologies. The change revises the limiting conditions for operation for the recirculation loops to modify and add action statements to provide further thermal limit control during single-loop operation to be consistent with GE methodology specified in the core operating limits report. The change also modifies the TS definitions and TS requirements for average planar linear heat generation rate. Additionally, TS Section 6.9.1.9 is revised to correct an error from a previous amendment that inadvertently removed a reference.

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 by George F. Wunder for/

Daniel S. Collins, Senior Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosures: 1. Amendment No. 154 to License No. NPF-57
2. Safety Evaluation

cc w/encls: See next page

Hope Creek Generating Station

cc:

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Daniel S. Collins, Senior Project Manager, Section 2
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cc w/encls: See next page

DISTRIBUTION

JClifford	OGC	ECobey, RGN-I	DLPM DPR
PUBLIC	DCollins	ACRS	CHolden
PDI-2 Reading	AAttard	FAkstulewicz	CRaynor
GHill (2)	TBoyce	GMiller	GMatakas, RGN-I
KKavanagh			

Package No.: ML TSs: ML
Amendment No.: ML042040164

OFFICE	PDI-2/PE	PDI-2/PM	PDI-2/LA	SRXB-A	IROB-A	OGC	PDI-2/SC
NAME	GMiller	GWunder for DCollins	CRaynor	FAkstulewicz	TBoyce	DFruchter	DCollins for JClifford
DATE	9/21/04	10/12/04	9/29/04	9/14/04	9/16/04	10/8/04	10/19/04

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PSEG NUCLEAR LLC

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 154
License No. NPF-57

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment filed by the PSEG Nuclear LLC dated December 24, 2003, as supplemented June 8, 2004, 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. 154, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA by Daniel S. Collins for/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: October 20, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 154

FACILITY OPERATING LICENSE NO. NPF-57

DOCKET NO. 50-354

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	Insert
i	i
xxv	xxv
1-1	1-1
3/4 2-1	3/4 2-1
3/4 4-1	3/4 4-1
6-21	6-21
6-22	6-22
6-23	6-23
6-26	6-26
B 2-2	B 2-2
B 3/4 1-1	B 3/4 1-1
B 3/4 1-3	B 3/4 1-3
B 3/4 1-5	B 3/4 1-5
B 3/4 2-1	B 3/4 2-1
B 3/4 2-2	B 3/4 2-2
B 3/4 2-3	B 3/4 2-3
B 3/4 4-1	B 3/4 4-1
B 3/4 4-2	B 3/4 4-2
B 3/4 4-3	B 3/4 4-3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 154 TO FACILITY OPERATING LICENSE NO. NPF-57

PSEG NUCLEAR LLC

HOPE CREEK GENERATING STATION

DOCKET NO. 50-354

1.0 INTRODUCTION

By letter dated December 24, 2003, as supplemented by letter dated June 8, 2004, PSEG Nuclear LLC (PSEG, or the licensee) requested changes to the Hope Creek Generating Station (HCGS) Technical Specifications (TSs). The supplement dated June 8, 2004, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC or the Commission) staff's original proposed no significant hazards determination as published in the Federal Register on February 17, 2004 (69 FR 7528).

The amendment would revise the TSs to support the use of GE14 fuel in the core reload for cycle 13. Specifically, the change would modify the TSs to reflect the exclusive use of General Electric (GE) core reload analysis methodologies. The change would revise the limiting conditions for operation (LCOs) for the recirculation loops to modify and add action statements to provide further clarity of thermal limit control during single-loop operation. The change would also modify the TS definitions and TS requirements for average planar linear heat generation rate (APLHGR). Additionally, TS Section 6.9.1.9 would be revised to correct an error from a previous amendment that inadvertently removed a reference.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.34, "Contents of Applications; Technical Information," requires that safety analysis reports be submitted that analyze the design and performance of structures, systems, and components provided for the prevention of accidents and the mitigation of the consequences of accidents. As part of the core reload design process, licensees (or vendors) perform reload safety evaluations to ensure that their safety analyses remain bounding for the design cycle. To confirm that the analyses remain bounding, licensees verify that key inputs to the safety analyses are conservative with respect to the current design cycle. If key safety analysis parameters are not bounded, a re-analysis or reevaluation of the affected transients or accidents is performed to ensure that the applicable acceptance criteria are satisfied.

Section 50.46 of 10 CFR, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors," sets forth requirements for the emergency core cooling system (ECCS). Section 50.46(a) of 10 CFR specifies acceptable approaches for

demonstration of compliance with the acceptance criteria contained in 10 CFR 50.46(b). Compliance with the criteria of sub-part b demonstrates the acceptability, following a loss-of-coolant-accident (LOCA), of: (b)(1) the peak calculated cladding temperature, (b)(2) the maximum cladding oxidation, (b)(3) the maximum hydrogen generation, (b)(4) the capability to maintain a coolable geometry, and (b)(5) the capability to maintain long-term core cooling. These criteria are designed such that meeting them provides reasonable assurance that the ECCS will prevent damage to the fuel cladding and protect the integrity of the reactor coolant system pressure boundary.

3.0 TECHNICAL EVALUATION

3.1 TS 6.9.1.9, "Core Operating Limits Report"

PSEG has proposed to delete, from TS 6.9.1.9, a reference to Asea Brown Boveri/Combustion Engineering calculational methodology (CENPD-300-P-A) from the list of analytical methods that are used to develop the Core Operating Limits Report (COLR). This deletion will reflect the exclusive use of the currently referenced NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR-II)," in the development of the COLR.

The GE critical quality - boiling length (GEXL) critical power correlation form was developed to predict the onset of boiling transition in boiling water reactors fuel assemblies during both steady-state and reactor transient conditions. The use of the GEXL correlation is necessary for determining the minimum critical power ratio (MCPR) operating limits resulting from transient analysis, the MCPR safety limit analysis, and core operating performance and design. The GEXL correlation is an integral part of the transient analysis methodology used by Global Nuclear Fuels (GNF). It is also used to confirm the adequacy of the MCPR operating limit and it can be used to determine the time of onset of boiling transition in the analysis of other events. The GEXL correlation is based on the relationship of critical quality versus boiling length. It expresses bundle average critical quality as a function of boiling length, thermal diameter, system pressure, lattice geometry, local rod peaking pattern, mass flux, and annular flow length.

By letter dated September 8, 2003, as supplemented by letters dated September 17, 2003, and March 17, 2004, GNF submitted Licensing Topical Report NEDC-33107P, "GEXL 80 Correlation for SVEA96+ Fuel," to the NRC staff for review. This report described the use of the GEXL 80 correlation to calculate fuel limits for SVEA96+ fuel with NEDE24011-P-A. On July 19, 2004, the staff issued its Safety Evaluation approving the use of the report specifically for HCGS. The staff's evaluation of the topical report is available in the Agencywide Documents Access and Management System (ADAMS) under accession number ML041980329. Given that the NRC staff has found that GEXL 80 correlation is appropriate for use in the development of the HCGS COLR for cores including SVEA96+ fuel, the requirements of 10 CFR 50.34 and 10 CFR 50.46 will continue to be met. The NRC staff, therefore, finds the exclusive use of NEDE24011-P-A in the development of the HCGS COLR to be acceptable.

Additionally, the licensee has proposed to re-insert a reference to CENPD-397-P-A, "Improved Flow Measurement Accuracy Using Crossflow Ultrasonic Flow Measurement Technology." The reference to the topical report was approved by Amendment Number 131 to facility operating license NPF-57. The associated Safety Evaluation is available in ADAMS under accession number ML030620765. This reference was accidentally omitted in the retyped pages submitted

for Amendment Number 145. Therefore, the re-insertion of the reference is considered to be administrative in nature and is acceptable.

In implementing this change, the licensee administratively deleted the references section and inserted all references into TS 6.9.1.9. No other TSs cited the references. Additionally, page xxv of the index is modified to reflect this change.

3.2 TS 3/4.4.1, "Reactor Coolant System, Recirculation System"

The licensee has proposed to revise TS 3/4.4.1.1.a.1.e as follows:

> Reduce the ~~Maximum~~ Average Planar Linear Heat Generation Rate (~~M~~APLHGR) limit to a value specified in the CORE OPERATING LIMITS REPORT for single loop operation, and

The proposed change brings the wording of the action statement into alignment with TS 3/4.2.1 "Power Distribution Limits, Average Planar Linear Heat Generation Rate." Removing the word Maximum does not change the parameter being monitored, the method by which it is calculated, nor the actions taken when the power distribution limit is exceeded. Therefore, the NRC staff finds the proposed change to be acceptable.

Additionally, PSEG has proposed to revise TS 3/4.4.1.1.a.1.e, which currently states "DELETED" to the following:

> Reduce the LINEAR HEAT GENERATION RATE (LHGR) limit to a value specified in the CORE OPERATING LIMITS REPORT for single loop operation, and

Currently, TS 3/4.2.4, "Power Distribution Limits, Linear Heat Generation Rate," requires that the LHGR not exceed the limits specified in the COLR. Both of these TSs require using a value listed in the COLR as the limit for LHGR. Although it is not explicitly stated in TS 3/4.2.4, use of the appropriate limits corresponding to current operational conditions is required. The addition of this action does, however, provide additional clarity as to which values from the COLR to use. Additionally, its inclusion in TS 3/4.4.1 does aide in identification of those TSs affected by single loop operation. Given that the proposed action statement does not alter the implementation of TS 3/4.2.1 and provides additional clarity to the operation of the plant, the NRC staff finds the change to be acceptable.

3.3 TS 3/4.2.1, "Power Distribution Limits, Average Planar Linear Heat Generation Rate"

The LHGR is the surface heat flux integrated over each square centimeter of cladding material in one linear foot of a fuel rod. The APLHGR is the average LHGR of all fuel rods in a given fuel bundle, in a given horizontal plane. Limits on LHGR and APLHGR are specified to ensure that fuel design limits are not exceeded anywhere in the core during normal operation, anticipated operational occurrences, and during postulated design basis LOCAs. Section 50.46 of 10 CFR specifies limits that, when exceeded, can potentially result in fuel damage and subsequent release of radioactive materials.

PSEG has proposed to change LCO 3.2.1 from:

> All AVERAGE PLANAR LINEAR HEAT GENERATION RATES (APLHGRs) for each type of fuel as a function of AVERAGE PLANAR EXPOSURE shall not exceed the limits specified in the CORE OPERATING LIMITS REPORT

to:

> All AVERAGE PLANAR LINEAR HEAT GENERATION RATES (APLHGRs) shall be less than or equal to the limits specified in the CORE OPERATING LIMITS REPORT

This change reflects the language used in NEDE-24011-P-A which would be the exclusive methodology used in the development of the COLR. The revised LCO would still require that the APLHGR be limited by the value listed in the COLR; thus, compliance with the requirements of 10 CFR 50.46 would continue. Given this consideration, the NRC staff finds the proposed change to be acceptable.

Additionally, PSEG proposed to modify the definition of Average Planar Linear Heat Generation Rate as follows:

> The AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR) shall be applicable to a specific planar height and is equal to the sum of the LINEAR HEAT GENERATION RATES for all fuel rods in the specified bundle at the specified height divided by the number of fuel rods in the fuel bundle at that height.

The addition of “at that height” provides additional clarification as to how the APLHGR is calculated. This change reflects the use of newer assemblies that may not have active fuel for the entire length of some rods. The use of the actual number of fuel rods at a particular height will provide a more accurate representation of the APLHGR at said height. The NRC staff finds the proposed change to be acceptable.

Due to the deletion of Average Planar Exposure from TS 3/4.2.1, the definition is no longer used. Therefore, its deletion from the definitions section is acceptable. Additionally, page i of the index is modified to reflect this change.

3.4 Technical Specification Bases

The licensee has proposed to revise the bases associated with the above changes. The NRC staff has reviewed these proposed modifications and found that they adequately represent the proposed TS changes and use of methodologies. Therefore, the NRC staff does not object to the proposed bases changes.

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. 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 (69 FR 7528). 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 Contributor: A. Attard
Q. Nguyen

Date: October 20, 2004