

July 23, 2004

Mr. A. Christopher Bakken, III  
President & Chief Nuclear Officer  
PSEG Nuclear LLC-X04  
Post Office Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION - ISSUANCE OF AMENDMENT RE:  
REVISION TO THE REACTOR PRESSURE VESSEL MATERIAL  
SURVEILLANCE PROGRAM (TAC NO. MB7151)

Dear Mr. Bakken:

The Commission has issued the enclosed Amendment No. 151 to Facility Operating License No. NPF-57 for the Hope Creek Generating Station. This amendment revises the Hope Creek licensing basis, as described in the Updated Final Safety Analysis Report, to replace the current plant-specific reactor pressure vessel material surveillance program with the Boiling Water Reactor Vessel and Internals Project Integrated Surveillance Program in response to your application dated December 23, 2002, as supplemented on August 14, 2003. The amendment modifies the basis for your compliance with the requirements of Appendix H to Title 10 of the *Code of Federal Regulations* Part 50, "Reactor Vessel Material Surveillance Program Requirements."

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/*

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. 151 to License No. NPF-57  
2. Safety Evaluation

cc w/encls: See next page

Hope Creek Generating Station

cc:

Mr. John T. Carlin  
Vice President - Nuclear Assessment  
PSEG Nuclear - N10  
P.O. Box 236  
Hancocks Bridge, NJ 08038

Mr. David F. Garchow  
Vice President - Engineering/Technical  
Support  
PSEG Nuclear - N28  
P.O. Box 236  
Hancocks Bridge, NJ 08038

Mr. Michael Brothers  
Vice President - Site Operations  
PSEG Nuclear - N10  
P.O. Box 236  
Hancocks Bridge, NJ 08038

Mr. James A. Hutton  
Plant Manager  
PSEG Nuclear - X15  
P.O. Box 236  
Hancocks Bridge, NJ 08038

Mr. Steven Mannon  
Acting Manager - Nuclear Safety and  
Licensing  
PSEG Nuclear - N21  
P.O. Box 236  
Hancocks Bridge, NJ 08038

Jeffrie J. Keenan, Esquire  
PSEG Nuclear - N21  
P.O. Box 236  
Hancocks Bridge, NJ 08038

Ms. R. A. Kankus  
Joint Owner Affairs  
Exelon Generation Company, LLC  
Nuclear Group Headquarters KSA1-E  
200 Exelon Way  
Kennett Square, PA 19348

Lower Alloways Creek Township  
c/o Mary O. Henderson, Clerk  
Municipal Building, P.O. Box 157  
Hancocks Bridge, NJ 08038

Dr. Jill Lipoti, Asst. Director  
Radiation Protection Programs  
NJ Department of Environmental  
Protection and Energy  
CN 415  
Trenton, NJ 08625-0415

Brian Beam  
Board of Public Utilities  
2 Gateway Center, Tenth Floor  
Newark, NJ 07102

Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

Senior Resident Inspector  
Hope Creek Generating Station  
U.S. Nuclear Regulatory Commission  
Drawer 0509  
Hancocks Bridge, NJ 08038

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

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\*SE input provided - no major changes made.

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PSEG NUCLEAR LLC

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 151  
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 December 23, 2002, as supplemented by letter dated August 14, 2003, 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 to authorize changes to the Updated Final Safety Analysis Report (UFSAR) to allow implementation of the Boiling Water Reactor Vessel and Internals Project Integrated Surveillance Program as the basis for demonstrating compliance with the requirements of Appendix H, "Reactor Vessel Material Surveillance Program Requirements," to 10 CFR Part 50, as set forth in the licensee's application dated December 23, 2002, as supplemented by letter dated August 14, 2003.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days. Implementation of the amendment is the incorporation into the UFSAR of the program description set out in the licensee's application dated December 23, 2002, as supplemented by letter dated August 14, 2003, and evaluated in the Safety Evaluation enclosed with this amendment. The licensee shall submit the changes authorized by this amendment with the next update of the UFSAR in accordance with 10 CFR 50.71(e).

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

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

Date of Issuance: July 23, 2004

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 151 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 23, 2002, (Reference 1) as supplemented by letter dated August 14, 2003, (Reference 2) PSEG Nuclear LLC (PSEG, or the licensee) requested Nuclear Regulatory Commission (NRC) approval to replace the current plant-specific reactor pressure vessel material surveillance program as described in the Hope Creek Generating Station (HCGS) Updated Final Safety Analysis Report (UFSAR) with the Boiling Water Reactor Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP). The amendment modifies the basis for PSEG's compliance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix H, "Reactor Vessel Material Surveillance Program Requirements," at HCGS. The supplement dated August 14, 2003, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards determination as published in the Federal Register on April 29, 2003 (68 FR 22752).

The BWRVIP ISP was submitted for NRC staff review and approval in topical reports BWRVIP-78, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan," and BWRVIP-86, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan" (References 3 and 4). Additional information necessary to establish the technical basis for, and proposed implementation of, the BWRVIP ISP was provided in letters from the BWRVIP dated December 15, 2000, and May 30, 2001 (References 5 and 6). The NRC staff approved the proposed ISP in a safety evaluation (SE) by letter dated February 1, 2002 (Reference 7). However, the NRC staff's SE required that plant-specific information be provided by BWR licensees who wish to implement this ISP for their facilities. PSEG's December 23, 2002, and August 14, 2003, submittals provided the required plant-specific information.

2.0 REGULATORY REQUIREMENTS

The NRC staff finds that PSEG, in its December 23, 2002, submittal, identified the applicable regulatory requirements. The regulatory requirements for which the NRC staff based its acceptance are described below.

Nuclear power plant licensees are required by 10 CFR 50.60, "Acceptance criteria for fracture prevention measures for lightwater nuclear power reactors for normal operation", to comply with the requirements in 10 CFR Part 50, Appendix H. Appendix H requires licensees to implement reactor pressure vessel (RPV) surveillance programs to "monitor changes in the fracture toughness properties of ferritic materials in the reactor vessel beltline region which result from exposure of these materials to neutron irradiation and the thermal environment." Two specific alternatives are provided which may be used to address 10 CFR Part 50, Appendix H.

The first alternative is the implementation of a plant-specific RPV surveillance program consistent with the requirements of American Society for Testing and Materials (ASTM) Standard Practice E 185, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels." In the design of a plant-specific RPV surveillance program, a licensee may use the edition of ASTM Standard Practice E 185 which was current on the issue date of the American Society of Mechanical Engineers (ASME) Code to which the reactor vessel was purchased, or later editions through the 1982 edition.

The second alternative provided in 10 CFR Part 50, Appendix H is the implementation of an ISP. Per this appendix, an ISP is defined as existing when, "the representative materials chosen for surveillance for a reactor are irradiated in one or more other reactors that have similar design and operating features." Five specific criteria are stated in Section III.C.1 of 10 CFR Part 50, Appendix H which must be met to support approval of an ISP:

- a. The reactor in which the materials will be irradiated and the reactor for which the materials being irradiated must have sufficiently similar design and operating features to permit accurate comparisons of the predicted amount of radiation damage.
- b. Each reactor must have an adequate dosimetry program.
- c. There must be adequate arrangement for data sharing between plants.
- d. There must be a contingency plan to assure that the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which data are expected.
- e. There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation, as a direct result of not requiring surveillance capsules in all reactors in the set.

As noted in Section 1.0 of this SE, the NRC staff approved this ISP in a SE dated February 1, 2002 (Reference 7). All of the criteria cited above for approval of the ISP were addressed either completely or partially in Reference 7. For those criteria which could not be fully addressed in Reference 7, plant-specific information would be required from licensees who wished to implement the BWRVIP for their facilities. As stated in Reference 7:

Licensees who wish to participate in the BWR ISP must provide, for NRC staff review and approval, information which defines how they will determine RPV and/or surveillance capsule fluences based on the dosimetry data which will be available for their facilities. This information must be submitted concurrently with

each licensee's submittal to replace their existing plant-specific surveillance program with the BWR ISP as part of their facility's licensing basis. The information submitted must be sufficient for the staff to determine that:

- (1) RPV and surveillance capsule fluences will be established as based on the use of an NRC-approved fluence methodology that will provide acceptable results based on the available dosimetry data,
- (2) If one methodology is used to determine the neutron fluence values for a licensee's RPV and one or more different methodologies are used to establish the neutron fluence values for the ISP surveillance capsules which "represent" that RPV in the ISP, the results of these differing methodologies are compatible (i.e., within acceptable levels of uncertainty for each calculation).

Regulatory Guide (RG) 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence," describes methods and assumptions acceptable to the NRC staff for determining the pressure vessel neutron fluence. The guide is intended to ensure the accuracy and reliability of the fluence determination required by General Design Criteria 14, 30, and 31 of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50.

This plant-specific information is required by the NRC staff to ensure that criterion III.C.1.b of 10 CFR Part 50, Appendix H for an ISP could be met by each facility, and to confirm that data which would be shared as part of the BWRVIP ISP could be effectively utilized by each licensee for the monitoring of RPV embrittlement for their facility.

### 3.0 TECHNICAL EVALUATION

In its application dated December 23, 2002, as supplemented on August 14, 2003, PSEG submitted information which addressed the information requirement specified in the NRC staff's February 1, 2002, SE (Reference 7). PSEG submitted a revised Section 5.3.1.6.2 of the HCGS UFSAR by Reference 2, which stated:

Future neutron fluence calculations will be performed in accordance with Regulatory Guide 1.190.

In a separate application dated March 31, 2004, in which PSEG requested NRC approval of revised RPV pressure-temperature limits, PSEG stated that they have performed an updated fluence analysis for the HCGS RPV based on a fluence calculational methodology in accordance with RG 1.190. The NRC staff has concluded that the inclusion of this statement in the HCGS UFSAR and the March 21, 2003, letter is sufficient to address both items (1) and (2) from Reference 7. Regarding item (1), the licensee's use of a methodology for determining the HCGS RPV neutron fluence values in accordance with RG 1.190 will provide acceptable results based upon the available dosimetry data. Regarding item (2), RPV surveillance capsules tested under this ISP will have their fluences determined by the use of a methodology which is in accordance with RG 1.190. The NRC staff has concluded that any two (or more) different fluence methodologies will provide "compatible" (as defined in Reference 7) results, provided that the best estimate fluence values are within each other's uncertainty bounds.

Inasmuch as this action was submitted as a license amendment, consistent with the NRC staff's understanding of the decision given in Commission Memorandum and Order CLI-96-13, PSEG provided a revised Section 5.3.1.6.1 of the HCGS UFSAR by Reference 1 which documented the licensee's incorporation of this ISP into the HCGS licensing basis:

The program for implementation of the scheduling and testing of the surveillance specimens is governed and controlled by BWR Vessel Internals Project (BWRVIP) Integrated Surveillance Program (ISP). The ISP is defined in BWRVIP-86-A, Updated BWR Vessel and Integrated Surveillance Program (ISP) Implementation Plan (reference 5.3-12) [BWRVIP-86-A, Updated BWR Integrated Surveillance Program (ISP) Implementation Plan, October 2002]. The NRC has issued a safety evaluation for the BWRVIP ISP and is included in Appendix B of BWRVIP-86-A. The withdrawal schedule will be in accordance with the BWRVIP ISP.

In addition, PSEG provided, in Section 5.3.1.6.1 of the HCGS UFSAR, the revised withdrawal schedule for the surveillance capsules in HCGS in accordance with the NRC staff-approved BWRVIP-86.

The NRC staff has concluded that the information provided in the revised HCGS UFSAR is adequate to document the licensee's intent to appropriately implement this ISP as the method for demonstrating the compliance of HCGS with the requirements of 10 CFR Part 50, Appendix H.

Based on the above, the information provided by PSEG was sufficient for the NRC to conclude that the BWRVIP ISP, as approved in Reference 7, can be implemented for HCGS as the basis for demonstrating the facility's continued compliance with the requirements of 10 CFR Part 50, Appendix H. The licensee shall modify the HCGS UFSAR as noted in Section 3.0 of this SE and as stated in their December 23, 2002, and August 14, 2003, submittals to document their intent to utilize the BWRVIP ISP for this purpose. The HCGS UFSAR is controlled in accordance with the requirements of 10 CFR 50.59, "Changes, tests, and experiments."

#### 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 (68 FR 22752). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

## 7.0 REFERENCES

1. D. F. Garchow (PSEG Nuclear LLC) to U.S. NRC Document Control Desk, "Request for Change to Reactor Material Surveillance Program," December 23, 2002.
2. D. F. Garchow (PSEG Nuclear LLC) to U.S. NRC Document Control Desk, "Request For Additional Information on Reactor Pressure Vessel Material Surveillance Program," August 14, 2003.
3. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "Project No. 704 - BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)," December 22, 1999.
4. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "Project No. 704 - BWRVIP-86: BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan," EPRI Technical Report 1000888, December 22, 2000.
5. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "PROJECT NO. 704 - BWRVIP Response to NRC Request for Additional Information Regarding BWRVIP-78," December 15, 2000.
6. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "PROJECT NO. 704 - BWRVIP Response to Second NRC Request for Additional Information on the BWR Integrated Surveillance Program," May 30, 2001.
7. W. H. Bateman (USNRC) to C. Terry, "Safety Evaluation Regarding EPRI Proprietary Reports "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)" and "BWRVIP-86: BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan," February 1, 2002.

Principal Contributor: J. Honcharik  
L. Lois

Date: July 23, 2004