

February 6, 2003

Mr. Bryce L. Shriver
Senior Vice President
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SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2 - REVISION
TO THE REACTOR PRESSURE VESSEL MATERIAL SURVEILLANCE
PROGRAM (TAC NOS. MB5714 AND MB5715)

Dear Mr. Shriver:

The Commission has issued the enclosed Amendment No. 208 to Facility Operating License No. NPF-14 and Amendment No. 182 to Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station, Units 1 and 2. These amendments are in response to your application dated July 25, 2002, as supplemented on October 23, 2002.

These amendments revise the Susquehanna Steam Electric Station Final Safety Analysis Report by replacing the current plant-specific reactor pressure vessel material surveillance program with the Boiling Water Reactor Vessel and Internals Project Integrated Surveillance Program.

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

Sincerely,

/RA/

Richard V. Guzman, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-387 and 50-388

Enclosures: 1. Amendment No. 208 to
License No. NPF-14
2. Amendment No. 182 to
License No. NPF-22
3. Safety Evaluation

cc w/encls: See next page

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*Provided SE input by memo. No substantive changes made.

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PPL SUSQUEHANNA, LLC
ALLEGHENY ELECTRIC COOPERATIVE, INC.
DOCKET NO. 50-387
SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 208
License No. NPF-14

1. The Nuclear Regulatory Commission (the Commission or the NRC) having found that:
 - A. The application for the amendment filed by PPL Susquehanna, LLC, dated July 25, 2002, as supplemented by letter dated October 23, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 Susquehanna Steam Electric Station Final Safety Analysis Report (FSAR) to implement the Boiling Water Reactor Vessel and Internals Project Reactor Pressure Vessel Integrated Surveillance Program as set forth in the application for amendment by PPL Susquehanna, LLC, dated July 25, 2002, as supplemented October 23, 2002.
3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of the date of issuance. Implementation of the amendment is the incorporation into the FSAR of the program description set out in the licensee's application dated July 25, 2002, as supplemented by letter dated October 23, 2002, and evaluated in the NRC staff's safety evaluation dated February 6, 2003. The licensee shall submit the changes authorized by this amendment with the next update of the FSAR in accordance with 10 CFR 50.71(e).

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: February 6, 2003

PPL SUSQUEHANNA, LLC

ALLEGHENY ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-388

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 182

License No. NPF-22

1. The Nuclear Regulatory Commission (the Commission or the NRC) having found that:
 - A. The application for the amendment filed by PPL Susquehanna, LLC, dated July 25, 2002, as supplemented by letter dated October 23, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 Susquehanna Steam Electric Station Final Safety Analysis Report (FSAR) to implement the Boiling Water Reactor Vessel and Internals Project Reactor Pressure Vessel Integrated Surveillance Program as set forth in the application for amendment by PPL Susquehanna, LLC, dated July 25, 2002, as supplemented October 23, 2002.
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FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Date of Issuance: February 6, 2003

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 208 TO FACILITY OPERATING LICENSE NO. NPF-14
AND AMENDMENT NO. 182 TO FACILITY OPERATING LICENSE NO. NPF-22
PPL SUSQUEHANNA, LLC
ALLEGHENY ELECTRIC COOPERATIVE, INC.
SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2
DOCKET NOS. 50-387 AND 388

1.0 INTRODUCTION

By application dated July 25, 2002, as supplemented by letter dated October 23, 2002, PPL Susquehanna, LLC (PPL, the licensee), requested amendments to modify the basis for their compliance with the requirements of Appendix H to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR), "Reactor Vessel Material Surveillance Program Requirements." The supplement dated October 23, 2002, 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) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on September 3, 2002 (67 FR 56328).

The proposed changes would revise the licensing basis for Susquehanna Steam Electric Station, Units 1 and 2 (SSES-1 and 2) by replacing the current plant-specific reactor pressure vessel (RPV) material surveillance program with the Boiling Water Reactor Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP). The BWRVIP ISP was submitted for NRC staff review and approval in the 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 1 and 2). The NRC staff approved the proposed BWRVIP ISP in a safety evaluation (SE) which was provided to the BWRVIP by letter dated February 1, 2002 (Reference 5).

2.0 REGULATORY EVALUATION

The NRC staff finds that PPL, in its July 25, 2002, and October 23, 2002, submittals, identified the applicable regulatory requirements. The regulatory requirements for which the NRC staff based its acceptance are described below.

Appendix G to 10 CFR Part 50, which is invoked by 10 CFR 50.60, specifies fracture toughness requirements for ferritic materials of pressure-retaining components of the reactor coolant pressure boundary, including RPVs, to provide adequate margins of safety during any condition

of normal plant operation, including anticipated operational occurrences and system hydrostatic tests. In order to demonstrate compliance with these fracture toughness requirements, test data regarding irradiated RPV material properties and the neutron fluence level of a licensee's RPV is necessary. Therefore, 10 CFR 50.60 also invokes Appendix H to 10 CFR Part 50, which requires licensees to implement RPV surveillance programs to "monitor changes in the fracture toughness properties of ferritic materials in the reactor vessel beltline region of light water nuclear power reactors which result from exposure of these materials to neutron irradiation and the thermal environment." Two specific alternatives are provided with regard to the design of a facility's RPV surveillance program which may be used to address the requirements of Appendix H to 10 CFR Part 50.

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 Conduction 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 Appendix H to 10 CFR Part 50 is the implementation of an ISP. Pursuant to Section III.C. of Appendix H, an ISP may be implemented, with the approval of the Director of the Office of Nuclear Reactor Regulation, by two or more facilities with similar design and operating features. Following are the five specific criteria stated in Appendix H to 10 CFR Part 50, upon which approval of an ISP shall be based:

- a. The reactor in which the materials will be irradiated and the reactor for which the materials are 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 the proposed BWRVIP ISP in an SE which was issued to the BWRVIP by letter dated February 1, 2002 (Reference 5). Additional information necessary to establish the technical basis for, and proposed implementation of, the BWRVIP ISP was provided in letters from the BWRVIP to the NRC dated December 15, 2000, and May 30, 2001 (References 3 and 4). In Reference 4, all of the above criteria for approval of an ISP were either completely or partially addressed. For those criteria which could not be

fully addressed, plant-specific information would be required from licensees who wished to implement the BWRVIP ISP for their facilities. As stated in the SE that approved the BWRVIP ISP:

“[A]n individual BWR licensee who wishes to participate in the BWR ISP shall provide, for NRC staff approval, information that defines how it will determine RPV and/or surveillance capsule fluences based on the dosimetry data which will become available for its facility. The staff will require that this information 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, and

(2) if one “best estimate” 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).”

This plant specific information was required by the NRC staff to ensure that criterion B. of Section III of Appendix H to 10 CFR Part 50 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 July 25, 2002, as supplemented October 23, 2002, PPL submitted information for SSES-1 and 2 which addressed the plant-specific information requested in the NRC staff’s SE approving the BWRVIP ISP. In its October 23, 2002, supplemental letter, PPL proposed to revise Section 4.1.4.5 of the SSES-1 and 2 FSAR to include the following sentence:

“The BWRVIP RAMA code or other NRC approved methodology that meets Regulatory Guide 1.190 will be used for revisions to the fluence calculations for both Units 1 and 2.”

Regulatory Guide (RG) 1.190 “Calculational and Dosimetry Methods For Determining Pressure Vessel Neutron Fluence,” was developed to provide state-of-the-art calculations and measurement procedures that are acceptable to the NRC staff for determining pressure vessel fluence. Although the NRC staff would note that the guidance in RG 1.190 is not a regulatory requirement of the NRC, the staff has concluded that the inclusion of this statement in the SSES-1 and 2 FSAR is sufficient to address the plant-specific information requested in the February 1, 2002, BWRVIP ISP SE. Regarding item (1) of Section 2.0 of this SE, PPL’s use of a methodology for determining the SSES-1 and 2 RPV neutron fluence values that is consistent with the attributes of RG 1.190 and has been approved by the NRC staff will provide

acceptable results based upon the available dosimetry data. Regarding item (2) of Section 2.0 of this SE, RPV surveillance capsules tested under the BWRVIP ISP will have their fluences determined by the use of a methodology that is consistent with the attributes of RG 1.190 and has been approved by the NRC staff. In addition, PPL provided additional information in its October 23, 2002, supplemental letter regarding when it would perform an updated RPV fluence analysis for the SSES-1 and 2 RPVs:

“The SSES Technical Specifications, as discussed in Amendment No. 200 to SSES Unit 1 Operating License (NPF-14) and Amendment No. 174 to SSES Unit 2 Operating License (NPF-22) require that new P-T [Pressure-Temperature] curves be implemented based on updated fluence calculations by May 1, 2005 and May 1, 2006 (Unit 2 and Unit 1 respectively)...The methodology used for the recalculation of the fluence will be in accordance with the requirements of Regulatory Guide 1.190.”

The NRC staff finds this intended course of action by PPL to be acceptable since the current RPV fluence calculations for SSES-1 and 2 RPVs are expected to remain conservative with respect to the actual accumulated RPV neutron fluence through May 1, 2006, and May 1, 2005, for SSES-1 and 2, respectively.

In addition, PPL provided a revision to SSES-1 and 2 FSAR, Section 5.3 and Tables 5.3-1b, 5.3-2b, and 5.3-3 which documented the incorporation of the BWRVIP ISP approved by NRC letter dated February 1, 2002. Specifically, the following text would be added to FSAR Section 5.3.1.6.1 to document PPL's incorporation of the BWRVIP ISP into the SSES-1 and 2 licensing bases:

“Charpy impact specimens for the reactor vessel surveillance programs are of the longitudinal orientation consistent with the ASME requirements prior to the issuance of the Summer 1972 Addenda and ASTM-E-185-82. Based on GE [General Electric] experience, the amount of shift measured by these irradiated longitudinal test specimens will be essentially the same as the shift in an equivalent transverse specimen.

The program for implementation of the scheduling and testing of the surveillance specimens is governed and controlled by the BWR Integrated Surveillance Program (ISP) [References 5.3-7 through 5.3-10 of the SSES-FSAR]. The Unit 1 second holder (131C7717G2) will be pulled in accordance with the schedule in the ISP. For Unit 2, all the information will come from other plants in the Integrated Surveillance Program. No capsules are scheduled to be withdrawn from Unit 2. Other plants will remove and test specimens in accordance with the ISP. The results from these tests will provide the necessary data to monitor embrittlement for Unit 2. Since the predicted adjusted reference temperature of the reactor vessel beltline steel is less than 100° F at end of life, the use of the capsules per the ISP meets the requirements of 10 CFR 50, Appendix H, and ASTM-E-185-82. The withdrawal schedule and other requirements are provided in the ISP.

For the extent of compliance to 10 CFR 50, Appendix H, see Tables 5.3-1b and 5.3-2b.”

The NRC staff has concluded that the information provided in the revised SSES-1 and 2 FSAR is adequate to document the licensee's intent to appropriately implement the BWRVIP ISP as the method for demonstrating the compliance of SSES-1 and 2 with the requirements of Appendix H to 10 CFR Part 50.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change 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 surveillance requirements. The NRC staff has determined that the amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding (67 FR 56328). Accordingly, the amendments meet 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.

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. 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.
2. 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.
3. C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "PROJECT No. 704 - BWRVIP Response to NRC Request for Additional Information on the BWR-78," December 15, 2000.

4. 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.
5. 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.

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