

January 13, 2003

Mr. Mark B. Bezilla
Vice President
FirstEnergy Nuclear Operating Company
Beaver Valley Power Station
Post Office Box 4
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT 1 - CHANGES TO THE REACTOR
PRESSURE VESSEL SURVEILLANCE CAPSULE WITHDRAWAL SCHEDULE
(TAC NO. MB3901)

Dear Mr. Bezilla:

By letter dated March 7, 2001, FirstEnergy Nuclear Operating Company (FENOC, the licensee) submitted for Nuclear Regulatory Commission (NRC) review and approval a request to modify the Beaver Valley Power Station, Unit 1 (BVPS-1), reactor pressure vessel (RPV) surveillance capsule withdrawal schedule. The proposed change would modify the withdrawal date for BVSP-1 RPV surveillance capsule X based on information provided in Table 7-1 of WCAP-15571, Revision 0, "Analysis of Capsule Y from Beaver Valley Unit 1 Reactor Vessel Radiation Surveillance Program." FENOC's submittal was made in accordance with the provision of Appendix H to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, paragraph B.3 which specifies that "[a] proposed withdrawal schedule must be submitted with a technical justification as specified in [10 CFR 50.4]. The proposed schedule must be approved prior to implementation."

Based on a January 25, 2002, submittal which sought NRC approval of a Master Curve-based methodology for the evaluation of the BVPS-1 RPV, FENOC requested that the NRC staff defer the review of their March 7, 2001, surveillance capsule withdrawal schedule change request since, if the licensee's Master Curve-based methodology were approved, additional modifications to the BVPS-1 RPV surveillance capsule withdrawal schedule would be required. Subsequently, based on NRC staff questions related to FENOC's Master Curve-based methodology, the licensee decided to withdraw their January 25, 2002, submittal. The licensee's request to withdraw their January 25, 2002, submittal was submitted by letter dated September 4, 2002, which also requested that the NRC staff restart the review of the original BVPS-1 surveillance capsule X withdrawal schedule change that had been proposed in FENOC's March 7, 2001, letter.

M. Bezilla

-2-

The NRC staff has evaluated FENOC's request to modify the capsule X withdrawal schedule for BVPS-1 and concluded that the proposed revision to the BVPS-1 RPV surveillance capsule withdrawal schedule conforms to the requirements of the 1982 Edition of the American Society for Testing and Materials Standard E 185, and 10 CFR Part 50, Appendix H. Thus, the proposed revision is acceptable for BVPS-1. Our safety evaluation is enclosed.

Sincerely,

/RA/

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

Docket No. 50-334

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST TO REVISE REACTOR PRESSURE VESSEL SURVEILLANCE CAPSULE
WITHDRAWAL SCHEDULE
PENNSYLVANIA POWER COMPANY
OHIO EDISON COMPANY
FIRSTENERGY NUCLEAR OPERATING COMPANY
BEAVER VALLEY POWER STATION, UNIT 1
DOCKET NO. 50-334

1.0 INTRODUCTION

By letter dated March 7, 2001, FirstEnergy Nuclear Operating Company (FENOC, the licensee) submitted for Nuclear Regulatory Commission (NRC) review and approval a request to modify the Beaver Valley Power Station, Unit 1 (BVPS-1) reactor pressure vessel (RPV) surveillance capsule withdrawal schedule. The proposed change would modify the withdrawal date for BVSP-1 RPV surveillance capsule X based on information provided in Table 7-1 of WCAP-15571, Revision 0, "Analysis of Capsule Y from Beaver Valley Unit 1 Reactor Vessel Radiation Surveillance Program." FENOC's submittal was made in accordance with the provision of Appendix H to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, paragraph B.3, which specifies that "[a] proposed withdrawal schedule must be submitted with a technical justification as specified in [10 CFR 50.4]. The proposed schedule must be approved prior to implementation."

Based on a January 25, 2002, submittal which sought NRC approval of a Master Curve-based methodology for the evaluation of the BVPS-1 RPV, FENOC requested that the NRC staff defer the review of their March 7, 2001, surveillance capsule withdrawal schedule change request since, if the licensee's Master Curve-based methodology were approved, additional modifications to the BVPS-1 RPV surveillance capsule withdrawal schedule would be required. Subsequently, based on NRC staff questions related to FENOC's Master Curve-based methodology, the licensee decided to withdraw their January 25, 2002, submittal. The licensee's request to withdraw their January 25, 2002, submittal was submitted by letter dated September 4, 2002, which also requested that the NRC staff restart the review of the original BVPS-1 surveillance capsule X withdrawal schedule change that was proposed in FENOC's March 7, 2001, letter.

2.0 REGULATORY EVALUATION

Nuclear power plant licensees are required by Appendix H to 10 CFR Part 50 to implement 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.” Regarding RPV surveillance program design and specimen testing, Appendix H to 10 CFR Part 50 incorporates by reference the editions of the American Society for Testing and Materials (ASTM) Standard Practice E 185 (ASTM E 185), “Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels,” through the 1982 Edition. Under Appendix H to 10 CFR Part 50, the licensee’s RPV surveillance program design and withdrawal schedule is required to meet the requirements of the Edition of ASTM E 185 that is current on the issue date of the American Society of Mechanical Engineers (ASME) Code to which the RPV was purchased, although later editions may be used, up to and including the 1982 Edition. The test procedures and reporting requirements must, however, meet the requirements of the 1982 Edition of ASTM E 185 (ASTM E 185-82), to the extent practical for the configuration of the specimens in the capsules.

The current BVPS-1 RPV surveillance capsule withdrawal schedule is designed to meet the requirements specified in Table 1 of ASTM E 185-82. In particular, BVPS-1 surveillance capsule X is intended to meet the requirements for the fifth capsule in a five capsule withdrawal schedule. The requirements for such a capsule are that it may be pulled at any time up to the end of a facility’s operating license at a time consistent with achieving a capsule neutron fluence ($E > 1.0$ MeV) of not less than once or greater than twice the peak RPV end of license (EOL) fluence.

3.0 TECHNICAL EVALUATION

In WCAP-15571, Revision 0, FENOC provided recalculated projected neutron fluence values for the BVPS-1 RPV and for surveillance capsule X based on the dosimetry results from the testing of BVPS-1 surveillance capsule Y. The peak BVPS-1 RPV neutron fluence at EOL (equivalent to about 28 effective full power years (EFPY) of operation) was determined to be approximately 3.5×10^{19} n/cm² ($E > 1.0$ MeV). In Table 7-1 of WCAP-15571, Revision 0, the licensee notes that the $E > 1.0$ MeV neutron fluence for BVPS-1 surveillance capsule X is projected to be 5.82×10^{19} n/cm² at 25.7 EFPY. Since this projected value for surveillance capsule X is between one and two times the projected peak BVPS-1 RPV neutron fluence, the licensee concluded that modifying their surveillance capsule withdrawal schedule to require the withdrawal of surveillance capsule X after 25.7 EFPY of operation would be consistent with the requirements of ASTM E 185-82 and, therefore, acceptable for meeting the requirements of Appendix H to 10 CFR Part 50. To document this surveillance capsule withdrawal schedule change, the licensee noted that BVPS-1, Updated Final Safety Analysis Report (UFSAR), Table 4.5-3, would be updated after receiving NRC staff approval.

The NRC staff has reviewed the information provided by the licensee in their March 7, 2001, letter and in WCAP-15571, Revision 0. The staff has determined that the licensee’s request to modify the BVPS-1 surveillance capsule X withdrawal date to 25.7 EFPY of operation (equivalent to an $E > 1.0$ MeV neutron fluence of approximately 5.82×10^{19} n/cm²) is consistent with the requirements of ASTM E 185-82 and, therefore, is acceptable for meeting the requirements of Appendix H to 10 CFR Part 50.

Because the proposed change to the RPV capsule removal schedule for BVPS-1 conforms to the requirements of ASTM E 185-82, and 10 CFR Part 50, Appendix H, the NRC staff finds the proposed change acceptable.

4.0 CONCLUSION

Based on the NRC staff's review of WCAP-15571, the NRC staff has found that the requested revision to the licensee's capsule withdrawal schedule satisfies the requirements of ASTM E 185-82. Therefore, the NRC staff approves FENOC's request to update the BVPS-1 RPV surveillance capsule withdrawal schedule in Table 4.5-3 of the BVPS-1 UFSAR to require removal of BVPS-1 surveillance capsule X after 25.7 EFPY of operation.

Principal Contributor: M. Mitchell

Date: January 13, 2003