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September 11, 2002
L-02-095

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

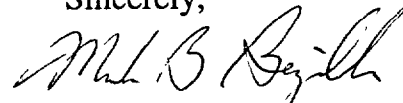
**Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Response to Bulletin 2002-02, Reactor Pressure Vessel Head and Vessel
Head Penetration Nozzle Inspection Programs**

On August 9, 2002, the NRC issued Bulletin 2002-02, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs." The NRC requested that specific information be provided within 30 days of the date of the Bulletin. In Attachment A to this letter, FirstEnergy Nuclear Operating Company (FENOC) hereby supplies the information requested by the Bulletin with respect to Beaver Valley Power Station (BVPS) Units 1 and 2.

If there are any questions concerning this matter, please contact Mr. Larry R. Freeland, Manager, Regulatory Affairs/Corrective Action at 724-682-5284.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 11, 2002.

Sincerely,



Mark B. Bezilla

Attachments:

- A. Response to NRC Bulletin 2002-02
- B. Commitment List

- c: Mr. D. S. Collins, NRR Project Manager
Mr. D. M. Kern, NRC Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)
Ms. C. O'Clair, Ohio Emergency Management Agency

A096

Attachment A

Response to NRC Bulletin 2002-02 "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs" for Beaver Valley Power Station (BVPS) Units 1 and 2

On August 9, 2002, the NRC issued Bulletin 2002-02, "Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs." FirstEnergy Nuclear Operating Company (FENOC) hereby supplies the information requested by the Bulletin with respect to Beaver Valley Power Station (BVPS) Units 1 and 2.

(1) The Bulletin required that within 30 days of the date of the Bulletin:

A. PWR addressees who plan to supplement their inspection programs with non-visual NDE methods are requested to provide a summary discussion of the supplemental inspections to be implemented. The summary discussion should include EDY, methods, scope, coverage, frequencies, qualification requirements, and acceptance criteria.

Response:

The Electric Power Research Institute (EPRI) Materials Reliability Project (MRP) developed an Inspection Plan and supporting technical basis documents which were reviewed and approved by the PWR utilities and transmitted to the NRC by EPRI and the Nuclear Energy Institute (NEI). This Plan presents a technically credible inspection regimen that assures to a high degree of certainty that leaks will be detected at an early stage long before wastage or circumferential cracking can challenge the structural integrity of the Reactor Coolant System (RCS) pressure boundary. Furthermore, implementation of the MRP Inspection Plan will assure continued compliance with the regulatory requirements cited within NRC Bulletin 2002-02 since this Plan addresses the safety aspects of the six concerns identified in the NRC Bulletin 2002-02. Therefore, BVPS will implement the MRP Inspection Plan and will comply with its requirements beginning with the conduct of the next planned refueling outage (RFO).

However, due to the seriousness of this issue and the long term planning required to develop a permanent solution, BVPS has elected to accelerate the schedule cited in the MRP Inspection Plan. Prior to the completion of the next scheduled RFO, BVPS Units 1 and 2 will each perform a supplemental ultrasonic examination of the reactor vessel (RV) head penetration base material and a supplemental Eddy Current (ECT) Inspection of the wetted surfaces of the Control Rod Drive Mechanism (CRDM) Tubing (in the area of interest) and the J-Weld wetted surface. This is in addition to the bare metal visual inspection on the top of the reactor vessel head at each penetration location.

Attachment A

The details of the proposed exams that address the attributes of NRC Bulletin 2002-02 item (1) A. are provided below:

Effective Degradation Years (EDY): FENOC has evaluated the current status of Beaver Valley Units 1 and 2 with regard to planned refueling outage (RFO) schedules, accrued Effective Full Power Years (EFPY), and Effective Degradation Years (EDY) calculated in accordance with MRP-48 (Equation 2.2). The results are presented in the following table:

| Unit | Date of next RFO | EDY at the next RFO |
|----------------------|------------------|---------------------|
| Beaver Valley Unit 1 | March 2003 | 14.0 |
| Beaver Valley Unit 2 | September 2003 | 10.1 |

Methods, Scope and Coverage: A 100 % bare metal visual inspection of the CRDM to RV junction at the top of the RV head, under the metal insulation, will be performed at the next BVPS Unit 1 and Unit 2 RFOs. The scope of this visual examination is planned for 100% of all nozzles.

An ultrasonic (UT) examination of all of the CRDMs and head vent penetration tube locations will be performed prior to the completion of the next BVPS Units 1 and 2 RFOs. The exam scope will include the material, starting from approximately 1" above the weld, down to the end of the respective penetration at the RV head ID surface. Since this UT exam will detect circumferential cracks in the tube, the concern for penetration ejection from crack propagation in the tube material is effectively addressed. Therefore, a UT examination for detection of axial and circumferential flaws coupled with the visual examination addresses the concern with wastage resulting from leakage and the potential for a control rod ejection resulting from a circumferential crack above the weld.

An eddy current (ECT) examination will be performed prior to the completion of the next BVPS Units 1 and 2 RFOs. The ECT examination will be performed on the wetted surfaces of the CRDM tubing from a location 1 inch above the J-weld area to the bottom of the CRDM tubing, and will also inspect the wetted surface of the J-weld. This inspection is performed to reveal any potential surface breaking flaws that would be an indication of potential communication of the RCS fluid with the carbon steel surface of the reactor head. If no surface breaking flaws are found, communication of the borated RCS fluid with the carbon steel of the reactor head is not possible and therefore no wastage below the external surface of the RV head can be occurring.

Frequencies: The examination of the BVPS RV heads following the next refueling outages (1R15 and 2R10) will be performed in accordance with the examination frequency identified by the MRP Plan, as a minimum. Since BVPS Unit 1 is planning to replace the Reactor Vessel head in the Spring of 2006, further inspection frequency and scope will be evaluated at a later time.

Attachment A

Qualification requirements: Personnel and procedures will be qualified in accordance with the applicable sections of ASME Section V and XI. The qualification requirements shall also be in accordance with the requirements of the MRP Inspection Plan.

Acceptance criteria: The acceptance criteria for the bare metal visual inspections is no evidence of leakage coming from the RV head penetration at the intersection of the bare metal head as identified in a 2002 EPRI report¹.

The acceptance criteria for the ultrasonic inspections will be determined based on the length, location and depth of an identified indication. It is anticipated that flaws will be removed or evaluated. If the flaws are evaluated, the approach will be to size the flaw, apply the growth rate identified in MRP-55 to the next inspection interval and evaluate using ASME flaw tolerance methods and acceptance criteria as modified by the NRC recommendation letter of November 21, 2001².

The acceptance criteria for any eddy current inspections will be based on the original construction code. However, for ECT inspections that are performed as a result of positive indication of a leak, the acceptance criteria will be no indications.

(1) The Bulletin required that within 30 days of the date of the Bulletin:

B. PWR addressees who do not plan to supplement their inspection programs with non-visual NDE methods are requested to provide a justification for continued reliance on visual examinations as the primary method to detect degradation.

Response:

BVPS has responded to item (1).A., therefore a response to item (1).B. is not required. However, BVPS is in agreement with the MRP comments that were provided regarding the six concerns identified in the Discussion Section of the Bulletin.

(2) The Bulletin required that within 30 days after plant restart following the next inspection of the RPV head and VHP nozzles to identify the presence of any degradation, all PWR addressees are required to provide:

A. The inspection scope and results, including the location, size, extent, and nature of any degradation that was detected; details of the NDE used; and criteria used to determine whether an indication, "shadow," or "backwall anomaly" is acceptable or rejectable.

B. The corrective actions taken and the root cause determinations for any degradation found.

Attachment A

Response:

BVPS will supply a summary report of the RV head inspection to provide the results and conclusions of the inspections performed during the applicable outages within 30 days following the outage. However, all other documentation, personnel qualifications and certifications and all procedures shall be maintained on Site in a manner consistent with reporting and records maintenance requirements of ASME Section XI.

¹ "Visual Examination for Leakage of PWR Reactor Head Penetrations on Top of RPV head: Revision 1 of 1006296, Includes Fall 2001 Results," Electric Power Research Institute (EPRI), Palo Alto, CA: March 2002, 1006899.

² NRC Letter, "Flaw Evaluation Criteria," Jack Strosnider, NRC, to Alex Marion, NEI, November 21, 2001.

Attachment B

Commitment List

The following list identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2 in this document. Any other actions discussed in the submittal represent intended or planned actions by Beaver Valley. These other actions are described only as information and are not regulatory commitments. Please notify Mr. Larry R. Freeland, Manager, Regulatory Affairs/Corrective Action, at Beaver Valley on (724) 682-5284 of any questions regarding this document or associated regulatory commitments.

| <u>Commitment</u> | <u>Due Date</u> |
|---|--|
| 1. A 100 % bare metal visual inspection of the CRDM to RV junction at the top of the RV head, under the metal insulation, will be performed at the next BVPS Unit 1 and Unit 2 RFOs. | 1R15 (Unit 1) and 2R10 (Unit 2) |
| 2. An ultrasonic (UT) examination of all of the CRDMs and head vent penetration tube locations will be performed prior to the completion of the next BVPS Units 1 and 2 RFOs. | Prior to the completion of 1R15 (Unit 1) and 2R10 (Unit 2) |
| 3. An eddy current (ECT) examination will be performed prior to the completion of the next BVPS Units 1 and 2 RFOs. The ECT examination will be performed on the wetted surfaces of the CRDM tubing from a location 1 inch above the J-weld area to the bottom of the CRDM tubing, and will also inspect the wetted surface of the J-weld. | Prior to the completion of 1R15 (Unit 1) and 2R10 (Unit 2) |
| 4. The examination of the BVPS RV heads following the next refueling outages (1R15 and 2R10) will be performed in accordance with the examination frequency identified by the MRP Plan, as a minimum. Since BVPS Unit 1 is planning to replace the Reactor Vessel head in the Spring of 2006, further inspection frequency and scope will be evaluated at a later time. | 1R16 (Unit 1) and 2R12 (Unit 2) |
| 5. BVPS will supply a summary report of the RV head inspection to provide the results and conclusions of the inspections performed during the applicable outages within 30 days following the outage. | Within 30 days following the applicable outages |