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L-06-044

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

Subject: Beaver Valley Power Station, Unit Nos. 1 and 2
BVPS-1 Docket No. 50-334, License No. DPR-66
BVPS-2 Docket No. 50-412, License No. NPF-73
Proposed Alternative to American Society of Mechanical Engineers Code Section XI Examination Requirements
(Request No. BV3-RV-3)

Pursuant to 10 CFR 50.55a(a)(3)(i), FirstEnergy Nuclear Operating Company (FENOC) hereby requests NRC approval to use an alternative weld examination method for certain reactor coolant pipe welds examined from the inner diameter surface. The affected welds are to be examined during the third ten-year inservice inspection interval for Beaver Valley Power Station (BVPS) Unit No. 1 and second ten-year inservice inspection interval for BVPS Unit No. 2. The details of the 10 CFR 50.55a request are enclosed.

FENOC requests approval by September 2006 to support the BVPS Unit No. 2 maintenance and refueling outage, scheduled for early October 2006.

The regulatory commitment contained in this submittal is listed in the attachment to this letter. If there are any questions concerning this matter, please contact Mr. Gregory A. Dunn, Manager, Fleet Licensing at (330) 315-7243.

Sincerely,

James H. Lash

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Enclosure: 10 CFR 50.55a Request No. BV3-RV-3 - Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)

Attachment: Commitment List

c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. P. C. Cataldo, NRC Senior Resident Inspector
Mr. S. J. Collins, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

Enclosure to Letter L-06-044
10 CFR 50.55a REQUEST No. BV3-RV-3, Revision 0

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)

--Alternative Provides Acceptable Level of Quality and Safety--

1.0 ASME CODE COMPONENTS AFFECTED

Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2 Reactor Coolant Pipe Welds. Nozzle-to-safe end, nozzle-to-piping and safe end-to-piping welds examined from the inner diameter (ID) surface using the remote mechanized, reactor vessel examination tool.

2.0 APPLICABLE CODE EDITION AND ADDENDA

ASME Section XI, 1989 Edition, no Addenda.

ASME Section XI, 1995 Edition, 1996 Addenda (Appendix VIII, Supplements 2 and 10, as required by 10 CFR 50.55a(g)(6)(ii)(C))

3.0 APPLICABLE CODE REQUIREMENTS

Examination Category R-A, Item R1.11 (RI-ISI Program categorization), formerly Category B-F, Item Number B5.10 (nozzle-to-safe end [BVPS Unit No. 2] / nozzle-to-piping welds [BVPS Unit No. 1]) and Category B-J, Item Number B9.11 (safe end-to-piping welds [BVPS Unit No. 2 only]) specify volumetric examination. The volumetric examination is to be conducted in accordance with Appendix VIII, Supplements 2 and 10, in the 1995 Edition with the 1996 Addenda per 10 CFR 50.55a (g)(6)(ii)(c).

Relief is requested from using only the ultrasonic method of Appendix VIII, Supplements 2 and 10, in the 1995 Edition with 1996 Addenda, when performing volumetric examination of the near surface of nozzle-to-safe end or safe end-to-pipe welds in the presence of surface roughness when the examination is conducted for the ID surface.

4.0 REASON FOR REQUEST

The examination vendor for BVPS reactor vessel examinations has been qualified for detection of circumferential flaws in accordance with Appendix VIII, Supplements 10 and 14, as demonstrated through the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) Program, for nozzle-to-safe end, nozzle-to-piping, and safe end-to-piping welds examined from the ID surface. The vendor is similarly qualified for detection of axial flaws provided the inside surface is machined or ground smooth with no exposed root reinforcement or counterbore.

For the welds that are the subject of this relief request, surface roughness may be present that could call into question the ultrasonic qualification demonstrated for detection of axial flaws in the volume immediately under the surface.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

FENOC proposes using surface geometry profiling software (profilometry), in conjunction with a focused immersion ultrasonic transducer positioned to provide accurate profile data across the examination volume, to confirm locations where the raw data indicates lack of transducer contact due to surface geometry. Eddy current examination will be used to supplement ultrasonic examination of the volume immediately under the surface for the nozzle-to-safe end or safe end-to-pipe welds when sufficient surface roughness calls into question the applicability of the ultrasonic examination qualification to detect axial flaws.

To supplement the ultrasonic examinations for rough surface detection coverage, the following eddy current techniques are utilized:

- Up to two plus point probes applied circumferentially on the pipe inside surface in scan increments of 0.080 inch circumferentially (for axial flaws) and 0.25 inch axially.
- Automated systems for data collection and analysis.

The target flaw size for the eddy current procedure is 0.28 inch, which is within the ASME Code linear flaw acceptance standards of 0.45 inch for austenitic material, and 0.625 inch for ferritic material (defined for the outside surface in the Code tables).

As discussed in the NRC safety evaluation for Diablo Canyon (see Precedent below), the examination vendor has developed an eddy current technique to augment the ultrasonic examination method and provide increased sensitivity at the near surface. The eddy current technique was first used in the VC Summer reactor vessel primary nozzle examination of 2000. The procedure was refined after its first use in 2000 by applying it to the VC Summer hot leg dissimilar metal weld section removed from service. The removed section had a number of primary water stress corrosion cracking flaws along with non-relevant indications resulting from metallurgical interface and surface geometry. The technique was refined using these actual flaws and geometric conditions in the removed section, allowing for successful use of the procedure in the VC Summer 2002 and 2003 examinations.

Since that time, the technique has been successfully blind tested for the Swedish authority SQC Kvalificeringscentrum AB (SQC NDT Qualification Center) under the program, "Qualification of Equipment, Procedure and Personnel for Detection, Characterization and Sizing of Defects in Areas in Nozzle to Safe End Welds at Ringhals Unit 3 and 4," by Hakan Soderstrand, dated July 10, 2003. The important qualification parameters (Reference SQC Qualification Report No. 019A/03) for Eddy Current in the SQC blind tests were as follows:

- Defect types: fatigue and stress corrosion cracks

- Tilt: +/- 10 degrees; Skew: +/- 10 degrees
- Detection target size: IDSCC 6 mm (0.25 inches) long
- Flaws Location: within 10 mm (13/32 inch)
- Length of the planar flaw within a 70% confidence level: +/- 9 mm (3/8 inch)
- False call rate: less than or equal to 20% for the personnel qualification tests

The technique has also been used to supplement examination of portions of the relevant near-surface volumes during the last 10 domestic pressurized reactor nozzle-to-pipe examinations conducted by the vendor.

The ultrasonic examinations, profilometry, and supplemental eddy current examinations will be conducted to the maximum extent practical and are subject to third party review by the Authorized Nuclear Inservice Inspector.

Use of ultrasonic profilometry and eddy current examination, with procedures and personnel qualified through the SQC blind tests to supplement Appendix VIII qualified ultrasonic procedures and personnel for these welds, provides additional assurance that surface-breaking flaws would be detected regardless of orientation or potential surface roughness. This provides equivalent or better examination results than those realized from ASME Code requirements. Therefore, the proposed alternative provides an acceptable level of quality and safety. In accordance with 10 CFR 50.55a(a)(3)(i), FENOC requests approval of the proposed alternative.

6.0 DURATION OF THE PROPOSED ALTERNATIVE

The proposed alternative is requested for the remainder of the third 10-Year Inservice Inspection Interval at BVPS Unit No. 1 and the second 10-Year Inservice Inspection Interval at BVPS Unit No. 2.

7.0 PRECEDENT

The NRC granted the proposed alternative on October 26, 2005 in response to a similar request from Pacific Gas and Electric Company. Reference to the NRC letter authorizing the alternative is provided below.

Diablo Canyon Power Plant, Unit Nos. 1 and 2
Docket Nos. 50-275 and 50-323
Letter dated October 26, 2005
TAC Nos. MC6693 and MC6694

ATTACHMENT
(To Letter L-06-044)

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 FENOC. They are described only as information and are not regulatory commitments. Please notify Mr. Gregory A. Dunn, Manager, Fleet Licensing at 330-315-7243 of any questions regarding this document or associated regulatory commitments.

Commitment	Due Date
Note: The following commitment applies to reactor nozzle-to-safe end, nozzle-to-piping and safe end-to-piping welds examined from the inner diameter surface.	
Eddy current examination will be used to supplement ultrasonic examination of the volume immediately under the surface for the nozzle-to-safe end or safe end-to-pipe welds when sufficient surface roughness calls into question the applicability of the ultrasonic examination qualification to detect axial flaws.	Examinations conducted during the remainder of the third 10-Year Inservice Inspection Interval at Unit No. 1 and second 10-year Inservice Inspection Interval at Unit No. 2.