August 22, 2008

Mr. Mark B. Bezilla
Site Vice President
FirstEnergy Nuclear Operating Company
Perry Nuclear Power Plant
Mail Stop A-PY-A290
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SUBJECT: PERRY NUCLEAR POWER PLANT, UNIT NO. 1 - REQUEST TO ELIMNATE SELECTED VOLUMETRIC EXAMINATIONS OF CAST VALVE BODY WELDS FOR THE SECOND 10-YEAR INSERVICE INSPECTION INTERVAL (TAC NO. MD8196)

Dear Mr. Bezilla:

By letter to the Nuclear Regulatory Commission (NRC) dated February 20, 2008, FirstEnergy Nuclear Operating Company (FENOC), submitted relief request number IR-043 for relief from certain American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section XI requirements at the Perry Nuclear Power Plant, Unit No. 1. Specifically, FENOC proposed eliminating selected volumetric examinations of cast valve body welds. The request is for the second 10-year inservice inspection interval.

The NRC staff has completed its review of the subject relief request, IR-043. As documented in the enclosed Safety Evaluation, the NRC staff has authorized the licensee-proposed elimination of selected volumetric examinations of cast body welds in accordance with Title 10 of the *Code of Federal Regulations,* Section 50.55a(a)(3)(ii), on the basis that the required surface and volumetric examinations of the subject welds would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Sincerely,

/RA/

Russell Gibbs, Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-440

Enclosure:
Safety Evaluation

cc w/encls: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUEST NUMBER IR-043

FIRSTENERGY NUCLEAR OPERATING COMPANY

FIRSTENERGY NUCLEAR GENERATION CORP.

OHIO EDISON COMPANY

PERRY NUCLEAR POWER PLANT, UNIT NO. 1

DOCKET NO. 50-440

1.0 INTRODUCTION

On February 20, 2008 (Agencywide Documents Access and Management System Accession No. ML080580410), FirstEnergy Nuclear Operating Company (the licensee), submitted a request for relief (IR-043) from certain American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code (Code), Section XI requirements at the Perry Nuclear Power Plant, Unit No. 1 (PNPP). Specifically, the licensee proposed eliminating the volumetric examination of cast valve body welds. The request is for the second 10-year inservice inspection (ISI) interval which began November 18, 1998, and is scheduled to end May 17, 2009.

2.0 REGULATORY EVALUATION

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(4), ASME Code Class 1, 2, and 3 components must meet the requirements set forth in ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plants Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that all inservice examinations and system pressure tests conducted during the first 10-year interval, and subsequent intervals, comply with the requirements in the latest edition and addenda of ASME Code, Section XI, incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 10-year interval. For PNPP, the ASME Code of record for the second 10-year ISI interval is the 1989 Edition of Section XI of the ASME Code.

Alternatives to requirements may be authorized or granted relief by the Nuclear Regulatory Commission (NRC or commission) pursuant to 10 CFR 50.55a(a)(3)(i), 10 CFR 50.55a(a)(3)(ii), or 10 CFR 50.55a(g)(6)(i). In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for the facility. Pursuant to 10 CFR 50.55a(g)(4)(iv), ISI items may meet the requirements set forth in subsequent editions and addenda of the ASME Code that are incorporated by reference in 10 CFR 50.55a(b),

subject to the limitations and modifications listed therein, and subject to Commission approval. Portions of editions and addenda may be used provided that related requirements of the respective editions and addenda are met.

3.0 TECHNICAL EVALUATION FOR RELIEF REQUEST RI-043

3.1 Affected Components

The affected components are Class 1, Table IWB-2500-1, Examination Category B-M-1, Item B12.30 (valves less than National Pipe Standard (NPS) 4) and Item B12.40 (valves NPS 4 or larger). The valve identification is listed in the table below:

ISI Examine ID	Item No.	Description	Group	ISI Isometric Drawing
1G33-F0101-SEAM	B12.30	3" Gate Valve Body Weld	1	SS-305-671-108
1G33-F0100-SEAM	B12.40	4" Gate Valve Body Weld	2	SS-305-671-108
1G33-F0106-SEAM	B12.40	4" Gate Valve Body Weld	2	SS-305-671-108
1G33-F0001-SEAM	B12.40	6" Gate Valve Body Weld	3	SS-305-671-108
1G33-F0004-SEAM	B12.40	6" Gate Valve Body Weld	3	SS-305-671-108

3.2 Applicable Code

The licensee's Code of record for the second 10-year ISI interval is the 1989 Edition of Section XI of the ASME Code. For ultrasonic testing examinations, the 1995 Edition with 1996 Addenda of Appendix VIII to Section XI of the ASME Code applies.

Table IWB-2500, Examination Category B-M-1 requires surface examination of valve body welds in valves less than 4" NPS and volumetric examination of valve body welds in valves 4" NPS and larger as defined by Figure IWB-2500-17.

3.3 Reason for the Request

The reason for this relief request is radiation dose avoidance. Three of the identified valve body welds require examination prior to the end of PNPP's current inspection interval (which ends May 2009). Various dose surveys from 2003 to 2007, show that the dose rates at the subject reactor water cleanup system (RWCS) valves ranged from 400 millirem/hour (400 mRem/hr) to 3,000 mRem/hr. Approximately 1 hour must be spent at each valve location to perform the examination support work and the nondestructive examinations (NDE). It is estimated that eliminating the Examination Category B-M-1 required examinations from these three RWCS valve body welds will provide a dose savings of at least 4,400 mRem.

3.4 Proposed Alternative

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested from performing the surface or volumetric examinations of the subject valve body welds due to radiological concerns. In accordance with Examination Category B-P, the welds will receive a VT-2 examination each refueling outage during the performance of the system leakage test of the Class 1 boundary.

3.5 Licensee Basis for the Alternative

The structural integrity of the pressure boundary was demonstrated during construction to meet the requirements of Section XI of the ASME Code, the valve body welds received preservice examinations and ISI examinations during the first 10-year interval, which were performed when piping and valves were at considerably lower dose rates, and no relevant indications were identified.

The subject valves are similar to 12 other Class 1 piping system valves that are subject to the same operating pressures and temperatures. The 12 valves are separated into 5 Category B-M-1 groupings which require an examination of one valve from each grouping. Of the 5 groupings, valves from 3 of the groupings have already been examined for this interval and there were no relevant indications.

A search of industry operating experience did not identify any failures of valve body welds. Due in part to the excellent performance of valve bodies, a revision of Section XI of the ASME Code was recently approved which deleted Category B-M-1 valve body weld examinations.

3.6 NRC Staff's Evaluation

The subject gate valve welds are used to attach the bonnet to the valve body. The ends of the valve body are connected to the piping system. The bonnet houses the shaft which slides the gate in and out of the valve body to control the water flow in the piping system. When gate is in the bonnet, the valve is open; and when the gate is seated in the valve body, the valve is closed. The subject welds are exposed to water flow and system pressure only when the gate is open (or partially open), and are exposed to the force necessary to keep the gate in place when the gate is closed.

The ASME Code discussed the contribution to system integrity and concluded that the elimination of surface and volumetric examinations had no affect on valve performance. The basis for the conclusion was presented in a technical paper which stated:

> "Industry experience has not identified any failures in pump casing or valve body welds. Risk Informed insights have not identified any degradation mechanism specifically associated with these welds. These examinations result in unnecessary radiation exposure to NDE personnel. Degradation of the pump or valve interior would be detected by the Category B-L-2 and B-M-2 [visual testing] VT-1 examinations or by the mechanic working on the component internals, and through wall leakage would be detected by the VT-2 examinations during system pressure tests."

Industry representatives with diverse views participate in the ASME Code consensus process. They discussed and evaluated proposed changes to the ASME Code. The NRC staff expressed their views and opinions at these consensus building meetings. The NRC staff participating at the meetings concluded that the current ASME Code requirement for VT-2 examinations performed on the subject welds each refueling outage provided reasonable assurance of structural integrity. Therefore, the NRC staff supported the ASME Code change to eliminate the volumetric and surface examinations from valve bodies.

4.0 CONCLUSION

Based on an absence of a degradation mechanism and an historical absence of weld failures in valve body welds, the NRC staff concludes that radiation exposure from performing the ASME Code required surface and volumetric examinations of the subject welds would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, the licensee's request to eliminate the subject weld examinations (surface and volumetric as appropriate) is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the second 10-year ISI interval.

All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: D. Naujock, NRR

Date: August 22, 2008