December 13, 2002

Mr. Lew W. Myers
Chief Operating Officer
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1 - REQUESTS FOR RELIEF FROM AMERICAN SOCIETY OF MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE REQUIREMENTS FOR THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM (TAC NO. MB5848)

Dear Mr. Myers:

By letter dated August 1, 2002 (Serial Number 2797), FirstEnergy Nuclear Operating Company submitted requests for relief (designated RR-A26 and RR-A27), which proposed alternatives to certain requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code associated with the replacement Reactor Vessel Closure Head (RVCH) at the Davis-Besse Nuclear Power Station. Additional information was provided in a letter dated September 23, 2002 (Serial Number 2809).

The staff's evaluation of the relief requests is enclosed.

For RR-A26, the staff concludes that the proposed alternative provides an acceptable level of quality and safety. Therefore, the proposed alternative contained in the request for relief is authorized pursuant to 10 CFR 50.55a(a)(3)(i) until the end of service life of the replacement RVCH or until the end of the third 10-year inservice inspection (ISI) interval (September 20, 2010), whichever occurs sooner.

For RR-A27, the staff concludes that the Code requirements would result in hardship without a compensating increase in quality and safety. The proposed alternative contained in the request for relief provides reasonable assurance of structural integrity of the RVCH Head-to-Flange Weld WH-7. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) until the end of service life of the replacement RVCH or until the end of the third 10-year ISI interval (September 20, 2010), whichever occurs sooner.

This completes the staff's activities associated with TAC No. MB5848.

Sincerely,

/RA by Douglass V. Pickett for/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure: Safety Evaluation

cc w/encl: See next page

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This completes the staff's activities associated with TAC No. MB5848.

Sincerely,

/RA by Douglass V. Pickett for/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosures: Safety Evaluation

cc w/encl: See next page

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ADAMS ACCESSION NO.: ML022830831
**See Previous Concurrence

OFFICE	PM:LPD3	LA:LPD3	SC:EMCB	OGC	SC:LPD3
NAME	BMoroney for JHopkins	THarris	SCoffin*	RHoefling**	DPickett for AMendiola
DATE	10/20/02	11/22/02	09/26/02	10/10/02	12/12/02

*Memo from S. Coffin to A. Mendiola dated 9/26/02

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

REQUEST FOR RELIEF NOS. RR-A26 AND RR-A27

FIRSTENERGY NUCLEAR OPERATING COMPANY

DAVIS BESSE NUCLEAR POWER STATION

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated August 1, 2002, FirstEnergy Nuclear Operating Company (the licensee), submitted requests for relief from conformance with certain requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code for the third 10-year interval Inservice Inspection (ISI) program at the Davis-Besse Nuclear Power Station (DBNPS). The requests proposed alternatives to the ASME Code Section XI requirements associated with the replacement Reactor Vessel Closure Head (RVCH). The licensee is replacing the DBNPS RVCH with the unused RVCH from the Midland plant. The first request (RR-A26) proposed an alternative to the ASME Code record requirements for the replacement RVCH construction radiography film and accompanying review forms. The second request (RR-A27) proposed an alternative to the ASME Code construction record requirements for the radiographic examination of the replacement RVCH head-to-flange weld. Additional information was provided in a letter dated September 23, 2002.

2.0 REGULATORY EVALUATION

As stated in Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a(a)(3), alternatives to the requirements of paragraph (g), *Inservice inspection requirements*, may be used, when authorized by the Nuclear Regulatory Commission, if the applicant demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components,” to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components 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 Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for the DBNPS, Unit 1

10-year ISI interval is the 1995 Edition through the 1996 Addenda of the ASME Boiler and Pressure Vessel Code. The applicable Rules for Construction of Nuclear Facilities Components Code (Section III) of record is the 1968 Edition through Summer 1968 Addenda.

3.0 TECHNICAL EVALUATION

3.1 Request for Relief No. RR-A26

Code Requirement:
IWA-4221(a) of the 1995 Edition through the 1996 Addenda of ASME Code Section XI requires that an item to be used for repair/replacement activities meet the Owner's Requirements and the applicable Construction Code to which the original item was constructed.

IX-336 of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III, requires that copies of procedure and personnel qualification data and radiographs with accompanying review forms including interpretation and disposition be maintained in accordance with requirements of IX-225.

IX-225(c), Quality Control Records - Duration of Files, of the 1968 Edition, 1968 Addenda of ASME Code Section III, requires that the vessel manufacturer maintain these records for at least ten (10) years after vessel completion. After that time, the manufacturer may either continue to maintain these records or may transfer the records and responsibility for their maintenance (for the life of the vessel) to the owner.

Component Identification:
Replacement RVCH - Component C24-2013-52-1- ASME Code Class 1 (Replacement for the existing DBNPS RVCH - Component 620-0014-52):

(a) RVCH Head-to-Flange Weld (Weld WH-7)

(b) 69 Control Rod Drive Mechanism (CRDM) Nozzle Body-to-Flange Welds (Weld WH-9)

Licensee's Proposed Alternative Examination: (as stated)
FENOC [the licensee] proposes, as an alternative to the ASME Code construction record requirements, to use the original Code Data Form showing the construction activities performed, and the supplemental radiographic examination performed and its associated records obtained in 2002 of the replacement RVCH Head-to-Flange Weld (WH-7) and the 69 CRDM Nozzle Body-to-Flange Welds (WH-9), as the records to be maintained as required by the ASME Code.

Licensee's Basis for Requesting Relief: (as stated)
The replacement RVCH is an ASME Code Section III Stamped Class A Vessel meeting the requirements of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III. This is attested to by the Manufacturer's Data Report for Nuclear Vessels (Form N-1A) (Code Data Form) for the Midland Reactor Vessel, of which the RVCH is a part. The Code Data Form was signed by both the constructor, Babcock & Wilcox (B&W), and the Authorized Nuclear Inspector, stating that the Midland Reactor Vessel conforms to the rules of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III. This

completed certification provides evidence that the required construction radiographs were performed and the results were acceptable.

The purpose of the construction radiographic film and reader's sheets is to demonstrate performance and acceptance of the radiographic examination. A log recording the performance of the radiographs is included in the records package. This, coupled with the signed Code Data Form signifying compliance with ASME Code Section III, provides evidence that the radiographic examination of the replacement RVCH Head-to-Flange Weld and the CRDM Nozzle Body-to-Flange Welds was performed and accepted.

Radiographic examinations of approximately 95 percent of the weld volume of the RVCH Head-to-Flange Weld and 100 percent of the weld volume of the 69 CRDM Nozzle Body-to-Flange Welds were conducted. No indications exceeding the acceptance standards were found, thus validating the original Code Data Form. The reader's sheets and radiographs for these examinations will be included in the data package for the replacement RVCH to supplement the existing construction non-destructive examination records.

This proposed alternative is requested in accordance with 10 CFR 50.55a(a)(3)(i). The original Code Data Form indicating compliance with the requirements of the 1968 Edition, Summer 1968 Addenda of Section III, coupled with the recent satisfactory performance of radiographic examinations of the RVCH Head-to-Flange Weld and the 69 CRDM Nozzle Body-to-Flange Welds provides assurance that these welds meet the acceptance standards of the ASME Code and therefore provides an acceptable level of quality.

Staff Evaluation:
The licensee noted that the construction radiography film and the accompanying review forms (reader's sheets) for the replacement RVCH Head-to Flange Weld (WH-7) and the CRDM Nozzle Body-to-Flange Welds (WH-9) are not available. However, the licensee does have the Manufacturer's Data Report for Nuclear Vessels (Form N-1A) (Code Data Form) for the Midland Reactor Vessel, of which the replacement RVCH is a part. The Code Data Form was signed by both the constructor, B&W, and the Authorized Nuclear Inspector, stating that the Midland Reactor Vessel conforms to the rules of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III. Furthermore, a log recording the performance of the radiographs is included in the records package. This, coupled with the signed Code Data Form signifying compliance with ASME Code Section III, provides evidence that the radiographic examinations of the replacement RVCH Head-to-Flange Weld and the CRDM Nozzle Body-to-Flange Welds were performed and accepted.

The licensee performed supplemental radiographic examinations of the Head-to-Flange Weld and the 69 CRDM Nozzle Body-to-Flange Welds to validate the Code Data Forms regarding the original examinations. The licensee found no indications exceeding the acceptance standards and they obtained 95 percent volumetric coverage of the RVCH Head-to-Flange Weld and 100 percent of the weld volume of the CRDM Nozzle Body-to-Flange Welds. The licensee has proposed as an alternative to the Code record maintaining requirements to use the original Code Data Form showing the construction activities performed, and the supplemental radiographic examination performed and its associated records obtained in 2002 of the replacement RVCH Head-to-Flange Weld (WH-7) and the 69 CRDM Nozzle Body-to-Flange Welds (WH-9).

The staff determined that, based on the recent satisfactory performance of radiographic examinations of the RVCH Head-to-Flange Weld and the 69 CRDM Nozzle Body-to-Flange Welds and the original Code Data Forms indicating compliance with the requirements of the 1968 Edition, Summer 1968 Addenda of Section III, the licensee's proposed alternative contained in its request for relief provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) until the end of service life of the replacement RVCH or until the end of the third 10-year ISI interval (September 20, 2010), whichever comes sooner.

3.2 Request for Relief No. RR-A27

Code Requirement:
IWA-4221(a) of the 1995 Edition through the 1996 Addenda of ASME Code Section XI requires that an item to be used for repair/replacement activities meet the Owner's Requirements and the applicable Construction Code to which the original item was constructed.

N-462.2 of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III requires that Category B full penetration welds as defined in paragraph N-461 be fully (100 percent) radiographed.

Component Identification:
Replacement Reactor Vessel Closure Head (RVCH) - Component C24-2013-52-1 - ASME Code Class 1 (Replacement for the existing DBNPS RVCH - Component 620-0014-52):

RVCH Head-to-Flange Weld (Weld WH-7)

Licensee's Proposed Alternative Examination: (as stated)
FENOC proposes, as an alternative to the ASME Code construction record requirements for a full radiograph of the RVCH Head-to-Flange Weld (WH-7), to use the Manufacturer's Data Report for Nuclear Vessels - Form N-1A (Code Data Form) that states the RVCH conforms to the ASME Code requirements, and the supplemental radiographic examination records obtained in 2002 that examined approximately 95 percent of the replacement RVCH Head-to-Flange Weld to satisfy the ASME Code requirements.

Licensee's Basis for Requesting Relief: (as stated)
The RVCH Head-to-Flange weld is an N-462.2 Category B joint with a full penetration weld as defined in paragraph N-461, and was performed as indicated by the completed Code Data Form. A supplemental radiographic examination of the RVCH Head-to-Flange Weld was recently conducted. The radiograph of the RVCH Head-to-Flange Weld examined approximately 95 percent of the weld. Three lifting lugs restricted access to the portion of the weld covered by the lifting lugs (See Attachment 1) [Attachment 1 is contained in the licensee's submital dated August 1, 2001, and is not included in this Safety Evaluation]. In order to obtain 100 percent coverage of the weld, the lifting lugs, which are attached by full penetration welds, would have to be removed and then re-attached following completion of the radiographic examination. Then, following re-attachment of the lifting lugs by welding, the RVCH would require post-weld heat treatment in accordance with the requirements of N-530 of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III. Such heat treatment could potentially distort the adjacent Control Rod Drive nozzles. The measures

necessary to obtain full radiographic coverage of Weld WH-7 would result in a considerable hardship without a compensating increase in the level of quality and safety.

No indications exceeding the acceptance standards were found during the supplemental radiographic examination of the RVCH Head-to-Flange Weld. In addition to the supplemental radiograph, a pre-service ultrasonic testing was performed on the weld, and no recordable indications were found. This, together with the existing records (described below), provides high confidence in the acceptable quality and integrity of the weld.

The replacement RVCH was part of an ASME Code Section III Stamped Class A Vessel meeting the requirements of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III. This is attested to by the Manufacturer's Data Report for Nuclear Vessels (Form N-1A) (Code Data Form) for the Midland Reactor Vessel, of which the RVCH is a part. The Code Data Form was signed by both the constructor, B&W, and the Authorized Nuclear Inspector, stating that the Midland Reactor Vessel conforms to the rules of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III. This certification provides evidence that the required construction radiographs were performed and the results were acceptable. In addition, although the construction radiographic film and reader's sheets are not available, a log recording the performance of the radiographic examination of the RVCH Head-to-Flange weld is available. These existing records provide assurance that full radiographic examination of the RVCH Head-to-Flange Weld was performed and the results were acceptable.

Staff Evaluation:
N-462.2 of the 1968 Edition, Summer 1968 Addenda of ASME Code Section III requires that Category B full penetration welds as defined in paragraph N-461 be fully (100 percent) radiographed. The licensee noted that the replacement RVCH Head-to-Flange Weld is an N-462.2 Category B full penetration weld and that complete documentation that this weld was radiographed per N-462.2 is not available. The licensee recently performed supplemental radiographic examinations of Weld WH-7 to supplement the original construction radiography. However, due to three lifting lugs in the area of the RVCH Head-to-Flange Weld, the licensee obtained approximately 95 percent of the weld volume. The licensee has proposed as alternative to the ASME Code construction record requirements for a full (100 percent) radiograph of the RVCH Head-to-Flange Weld (WH-7), to use the Manufacturer's Data Report for Nuclear Vessels - Form N-1A (Code Data Form) that states the RVCH conforms to the ASME Code requirements, and the supplemental radiographic examination records obtained in 2002 that examined approximately 95 percent of the replacement RVCH Head-to-Flange Weld to satisfy the ASME Code requirements.

For the licensee to obtain full coverage of the weld, the lifting lugs would have to be removed and then re-attached following completion of the radiographic examination. In order to re-attach the lifting lugs by welding, the RVCH would require to be post-weld heat treated. That heat treatment could potentially distort the adjacent CRDM nozzles and flange, thus, rendering the RVCH unusable. The staff determined that the necessary measures to obtain the additional 5 percent radiographic coverage of Weld WH-7 would result in a hardship without a compensating increase in the level of quality and safety. Based on the original documentation, and the satisfactory results obtained from the

supplemental radiographic coverage of Weld WH-7, the staff finds that the licensee's proposed alternative provides reasonable assurance of structural integrity of RVCH Head-to-Flange Weld WH-7. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) until the end of service life of the replacement RVCH or until the end of the third 10-year ISI interval (September 20, 2010), whichever occurs sooner.

4.0 CONCLUSION

The staff concludes that, for Request for Relief RR-A26, the licensee's proposed alternative provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative contained in its request for relief is authorized pursuant to 10 CFR 50.55a(a)(3)(i) until the end of service life of the replacement RVCH or until the end of the third 10-year ISI interval (September 20, 2010), whichever occurs sooner.

For Request for Relief RR-A27, the staff concludes that the Code requirements would result in hardship without a compensating increase in quality and safety. The licensee's proposed alternative contained in its request for relief provides reasonable assurance of structural integrity of the RVCH Head-to-Flange Weld WH-7. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) until the end of service life of the replacement RVCH or until the end of the third 10-year ISI interval (September 20, 2010), whichever occurs sooner.

Principal Contributor: T. McLellan, NRR

Date: December 13, 2002