September 27, 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 FOR THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN (TAC NO. MB1607)

Dear Mr. Myers:

By letter dated September 19, 2000 (Serial Number 2672), FirstEnergy Nuclear Operating Company submitted the Third 10-Year Interval Inservice Inspection Program for the Davis Besse Nuclear Power Station, Unit 1. Included in the submittal were requests for relief from conformance with certain requirements of Section XI of the 1995 Edition and Addenda through the 1996 Addenda, of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. Additional information was provided in your letters dated September 7, 2001 (Serial Number 2729), November 27, 2001 (Serial Number 2736), February 6, 2002 (Serial Number 2762), and electronic transmission dated February 14, 2002 (ADAMS accession number ML022410047).

The enclosure includes the staff's evaluation for relief requests (RRs) A3, A10, and A16. The remaining RRs included in your submittal of September 19, 2000, will be addressed in future correspondence. The staff's evaluation of RR-A3, A10, and A16 is summarized as follows:

RR-A3: Insulated ASME Class 1 and 2 Pressure Retaining Bolted Connections - Implementation of Code Case N-616

The staff concludes that the removal of insulation at elevated pressures and temperatures would result in a hardship without a compensating increase in the level of quality and safety. Furthermore, the staff concludes that the licensee's proposed alternative to use Code Case N-616 provides reasonable assurance of structural integrity of the bolted connections. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year interval or until such time Code Case N-616 is referenced in a future revision of Regulatory Guide (RG) 1.147. At that time, if the licensee intends to continue to implement Code Case N-616, the licensee should follow all provisions in the subject code case with the limitations (if any) listed in RG 1.147.

RR-A10 Corrective Action of Leakage Identified at Bolted Connections - Implementation of Code Case N-566-1

The staff concludes that the proposed alternative provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative to use Code Case N-566-1 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year interval or until such time Code Case N-566-1 is referenced in a future revision of RG 1.147. At that time, if the licensee intends to continue to implement Code Case N-566-1, the licensee should follow all provisions in the subject code case with the limitations (if any) listed in RG 1.147.

RR-A16 Annual Training for Ultrasonic Examination Personnel

The staff concludes that the proposed alternative provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative to incorporate the annual ultrasonic training requirements included in 10 CFR 50.55a(b)(2)(xiv) is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year interval.

Sincerely,

/RA by L. Raghavan for/

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

Docket No. 50-346

Enclosure: Staff Evaluation

cc w/encl: See next page

RR-A10 Corrective Action of Leakage Identified at Bolted Connections - Implementation of Code Case N-566-1

The staff concludes that the proposed alternative provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative to use Code Case N-566-1 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year interval or until such time Code Case N-566-1 is referenced in a future revision of RG 1.147. At that time, if the licensee intends to continue to implement Code Case N-566-1, the licensee should follow all provisions in the subject code case with the limitations (if any) listed in RG 1.147.

RR-A16 Annual Training for Ultrasonic Examination Personnel

The staff concludes that the proposed alternative provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative to incorporate the annual ultrasonic training requirements included in 10 CFR 50.55a(b)(2)(xiv) is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year interval.

Sincerely,

/RA by L. Raghavan for/

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Enclosure: Staff Evaluation

cc w/encl: See next page

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DATE	09/03/02	08/30/02	09/10/02	05/30/02	09/27/02

*See TChan to AMendiola memo dated 5/30/02
**No legal objection

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Davis-Besse Nuclear Power Station, Unit 1

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION

RELIEF REQUEST (RR) NOS. RR-A3, RR-A10, AND RR-A16

DAVIS BESSE NUCLEAR POWER STATION, UNIT 1

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-346

1.0 INTRODUCTION

Inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME *Boiler and Pressure Vessel (B&PV) Code* and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the Nuclear Regulatory Commission (NRC), if the licensee 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 pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection (ISI) 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 Davis-Besse Nuclear Power Station, Unit 1, third 10-year ISI interval is the 1995 Edition through the 1996 Addenda of the ASME B&PV Code.

2.0 EVALUATION

The Materials and Chemical Engineering Branch has reviewed the information concerning third 10-year ISI program Relief Request (RR) Nos. RR-A3, RR-A10, and RR-A16 for Davis Besse Nuclear Power Station, Unit 1, provided by FirstEnergy Nuclear Operating Company (the licensee) letter dated September 19, 2000. The licensee provided additional information in its letters dated November 27, 2001, February 6, 2002, and electronic transmission of February 14, 2002 (ADAMS accession number ML022410047). This is a partial review of the licensee's submittals. The remaining relief requests will be addressed in future correspondence.

ENCLOSURE

The information provided by the licensee in support of the request for relief from Code requirements has been evaluated and the basis for disposition is documented below.

2.1 RR-A3:

Code Requirement: ASME Section XI, 1995 Edition, 1996 Addenda, Paragraph IWA-5242(a) requires that for systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure retaining bolted connections for VT-2 visual examination.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(a)(3)(ii), relief is requested from the removal of insulation from pressure retaining bolted connections when conducting the pressure tests and VT-2 visual examination for ASME Class 1 and 2 systems.

Licensee's Basis for Requesting Relief: (As stated)
There are approximately 60 insulated Class 1 bolted connections including the four Reactor Coolant Pumps. It is estimated that removal and replacement of the insulation will incur 20 man-rem of exposure. Since Class 1 pressure tests must be conducted with the plant in Hot Standby (Mode 3) to satisfy technical specification pressure/temperature limits, replacement of insulation must be conducted on components at their normal operating pressure (2155 psig) and temperature (532 ^{o}F). It is estimated that this would add at least two days to the critical path of a refueling outage, delaying return of the unit to service.

The intended purpose of removing insulation from bolted connections during pressure tests is to more readily detect boric acid leakage and potential corrosion of bolting. Boric acid leakage leaves a boric acid crystal residue when it evaporates. As the Class 1 leakage tests are conducted at normal operating pressure (2155 psig), the same leakage would occur during normal operation, as would be expected during the Class 1 leakage test. Leakage following normal operation would be evident due to the presence of boric acid residue. This residue would be visible during inspections conducted with the system depressurized.

Not all materials are susceptible to corrosion from boric acid leakage. ASME Code Case N-616 states that when corrosive resistant bolting material used has a chromium content greater than or equal to 10 percent, such as SA-564 Grade 630 H1100, SA-453 Grade 660, SB-637 (UNS N07718) or SB-637 (UNS N07750), it is permissible to perform the VT-2 examination without insulation removal. The similar corrosion resistance of 410 series stainless steels (such as SA-193 Grade 6) has been demonstrated in Electric Power Research Institute Reports NP-5769 and TR-104748.

Relief is requested pursuant to 10 CFR 50.55a(a)(3)(ii) as the removal of insulation at elevated pressures and temperatures would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. A relief request for performing the VT-2 visual examination of Class 1 bolted connections without the system pressurized was previously approved for the Second 10-Year Interval in RR-A7 (TAC Nos. M79034 and M77942).

Corrosion resistance bolting has been in service for many years. There have not been any incidents of corrosion of these materials noted. Removing and reinstalling insulation, including erection and removal of scaffolding when necessary to provide access, would require significant time and radiation exposure to facilitate examination for a condition which experience throughout the industry has shown to be very unlikely to occur.

The Code requires that a VT-2 visual examination be performed during system pressure tests at nominal operating pressures and temperatures for that system. The Class 1 pressure tests must be conducted with the plant in Hot Standby (Mode 3) to satisfy the technical specification pressure/temperature limits. Based on the safety implications of removing and/or reinstalling the insulation at elevated pressures and temperatures, the removal of insulation and the performance of the VT-2 visual examinations at least once per inspection period with the system depressurized is acceptable. Any leakage at the bolted connection would be evident from boric acid residue.

Licensee's Proposed Alternative Examination: (As stated)
Code Case N-616 will be implemented for the VT-2 examination of ASME Class 1 and 2 bolting. The VT-2 examination will be performed without insulation removal when corrosive resistant bolting material used in a pressure retaining bolted connection has a chromium content greater than or equal to 10 percent. Code Case N-616 will not be applied to:

a) A453 Grade 660 bolting that is pre-loaded to 85 percent of yield or greater.

b) Bolts made from A-193 Grade B6 material (Grade 410 stainless steel) tempered below 1100 °F.

c) Bolts made from SA-564 grade 630 material that were not hardened to H1100 condition.

For Class 1 and 2 pressure retaining connections with bolting that has a chromium content less than 10 percent, insulation will be removed to perform the VT-2 visual examination of the bolted connection for evidence of leakage. This VT-2 visual examination will be performed once each period. For Class 1 systems, the VT-2 examination will be performed without the connection being pressurized. For Class 2 systems, the VT-2 examination will be performed with the system pressurized.

At all bolting connections, included those containing corrosive resistant bolting material, if evidence of leakage is detected, either by discovery of active leakage or evidence of boric acid crystals, the insulation will be removed and the bolted connection will be reexamined and, if necessary, evaluated in accordance with the corrective measures of paragraph IWA-5250.

In the licensee's letter dated November 27, 2001, in response to NRC's Request for Additional Information the licensee stated:

The use of Code Case N-616 has been previously approved for Arkansas Nuclear One via TAC MB0665 and MB0694. This includes 410 series stainless steels. The Davis-Besse Nuclear Power Station does not intend to change the frequency of performing VT-2 examinations of Class 1 systems. In addition to using Code Case N-616, the request is to remove insulation on the components not covered by Code Case N-616 each period versus each refueling outage. If evidence of boric acid residue is found on one of the components not scheduled for insulation removal, the insulation will be removed in accordance with the Boric Acid Corrosion Control Program. Removal of insulation each period versus each refueling outage was approved in the second interval (Relief Request RR-A7 in the second interval) via TACs M79034 and M77942.

Evaluation:
The ASME Code, Section XI (the Code), 1995 Edition and 1996 Addenda requires the removal of all insulation from pressure-retaining bolted connections in systems borated for the purpose of controlling reactivity when performing VT-2 visual examinations during system pressure tests. The Code requires this examination to be performed during each refueling outage for Class 1 systems, and each inspection period for Class 2 and 3 systems. The licensee proposed to use Code Case N-616, "Alternative Requirements for VT-2 Visual Examination of Classes 1, 2, and 3 Insulated Pressure Retaining Bolting Connections, Section XI, Division 1," in lieu of the Code requirements.

The staff has developed a position over the years on the use of AISI Type 17-4 PH stainless steel (SA-564 Grade 630), AISI Type 410 stainless steel (SA-193 Grade 6), and A-286 stainless steel (SA-453 Grade 660) fasteners. The 17-4 PH stainless steel and the 410 stainless steel are suitable for use in contact with primary water if they are aged at a temperature of 1100 °F or higher. If they are aged at a lower temperature, they become susceptible to primary water stress corrosion cracking. The hardness of these alloys should be below R_c 30 if they are properly heat treated. A-286 stainless steel is susceptible to stress corrosion cracking in primary water, particularly if preloaded above 100 thousand pounds per square inch (ksi). Bengtsson and Korhonen of ASEA-ATOM, Vasteras, Sweden, examined the behavior of A-286 in a boiling water reactor (BWR) environment, as reported in the Proceedings of the International Symposium on Environmental Degradation of Materials in Nuclear Power Systems-Water Reactors, August 22-25, 1983, Myrtle Beach, South Carolina, sponsored by the National Association of Corrosion Engineers, the Metallurgical Society of American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME), and the American Nuclear Society. They found that A-286, in comparison to other tested materials, was the most susceptible material they tested to intergranular stress corrosion cracking in BWR water. They also found that A-286 is less likely to crack as the applied stress is reduced. Piascik and Moore from Babcock & Wilcox reported a number of vessel internals bolt failures of A-286 bolts in Nuclear Technology, Vol. 75, December 1986 in pressurized-water reactor water. They correlated the failures with bolt fillet peak stress and found that bolts preloaded below 100 ksi showed no failures.

The NRC staff position is that any 17-4 PH stainless steel or 410 stainless steel stud or bolt aged at a temperature below 1100 °F or with hardness above R_c 30 must have the thermal insulation removed for VT-2 examination during the system pressure test. For A-286 stainless steel studs or bolts, the preload must be verified to be below 100 ksi or

the thermal insulation must be removed and the joint visually inspected. For nuts conforming to SA-194, experience indicates it would not be necessary to remove the thermal insulation for visual inspection.

The licensee noted that Code Case N-616 will not be applied to:

a) A453 Grade 660 bolting that is pre-loaded to 85 percent of yield or greater.

b) Bolts made from A-193 Grade B6 material (Grade 410 stainless steel) tempered below 1100 °F.

c) Bolts made from SA-564 grade 630 material that were not hardened to H1100 condition.

For Class 1 and 2 pressure retaining connections with bolting that has a chromium content less than 10 percent, the licensee will remove the insulation to perform the VT-2 visual examination of the bolted connection for evidence of leakage, and that this examination will be performed once each period. For Class 1 systems, the licensee will perform VT-2 examinations without the connection being pressurized and for Class 2 systems, the VT-2 examinations will be performed with the system pressurized.

The licensee noted that if evidence of leakage is detected at any bolted connection, including those containing corrosion resistant bolting material, either by discovery of active leakage or evidence of boric acid crystals, the insulation will be removed and the bolted connection will be reexamined and, if necessary, evaluated in accordance with the corrective measures of paragraph IWA-5250.

Code Case N-616 has eliminated the requirement to remove the insulation from ASME Classes 1, 2, and 3 pressure retaining bolted connections when conducting a VT-2 examination if corrosion resistant bolting is used. However, the code case does not include the requirement to hold the system at operating pressure and temperature for a minimum of 4 hours. The licensee provided clarifying information regarding hold times prior to VT-2 examinations for Class 1 and 2 systems. The licensee stated that for Class 1 bolted connections, the system will have been pressurized for the entire operating cycle prior to the VT-2 examinations. For Class 2 bolted connections, the system will be either maintained at nominal operating pressure for 4 hours or the insulation will be removed for the VT-2 examinations of the bolted connections.

The staff has determined that the removal of insulation at elevated pressures and temperatures for the purpose of examining bolted connections utilizing corrosion resistant bolting material would result in a hardship without a compensating increase in the level of quality and safety. Furthermore, the staff determined that since the licensee will perform the VT-2 examinations for Class 1 bolted connections, after the system has been pressurized for the entire operating cycle and for Class 2 bolted connections, the system will be maintained at nominal operating pressure for 4 hours prior to the VT-2 examinations, significant leakage, if any, would penetrate the insulation and be

detected. In addition, periodic removal of the insulation for VT-2 examination, even under cold and non-pressurized conditions, should allow for detection of even minor leakage in a timely manner via the presence of boric acid crystals or residue. Therefore, the licensee's proposed alternative provides reasonable assurance of structural integrity of the bolted connections.

For RR-A3, the staff concludes that the removal of insulation at elevated pressures and temperatures would result in a hardship without a compensating increase in the level of quality and safety. Furthermore, the staff concludes that the licensee's proposed alternative provides reasonable assurance of structural integrity of the bolted connections. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year interval or until such time Code Case N-616 is referenced in a future revision of Regulatory Guide (RG) 1.147. At that time, if the licensee intends to continue to implement Code Case N-616 the licensee should follow all provisions in the subject code case with the limitations (if any) listed in RG 1.147.

2.2 RR-A10:

Code Requirement: ASME Section XI, 1995 Edition, 1996 Addenda, IWA-5250(a)(2) requires that if leakage occurs at a bolted connection on other than a gaseous system, one of the bolts shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100. The bolt selected shall be the one closest to the source of leakage.

Licensee's Code Relief Request: (As stated)
Relief is requested from removing bolting and performing VT-3 examination of bolts when leakage is detected during system pressure tests. The requirements of Code Case N-566-1, "Corrective Action for Leakage Identified at Bolted Connections," will be implemented. A VT-1 visual examination will be used to provide the visual evidence of corrosion at the bolted connection pursuant to item (c)(6) of the Code Case.

Licensee's Basis for Requesting Relief: (As stated)
The removal of bolts for VT-3 visual examination is not always the most prudent action when leakage is discovered at a bolted connection. Leakage at bolted connections is typically identified during system leakage tests. For Class 1 systems, this leakage test is conducted prior to plant startup following each refueling outage. This test is performed at full operating pressure (2155 psig) and temperature. When leakage is discovered during this test, the corrective action (i.e. removal of bolts) must be performed with the system at full temperature and pressure or the plant must be cooled down. The removal of a bolt under full temperature and pressure conditions can be extremely physically demanding due to the adverse heat environment. Cooling down the plant subjects the plant to additional heatup and cooldown cycles and can add 3-4 days to the duration of a refueling outage. Bolted connections associated with pumps and valves are typically studs threaded into the body of the component. Removal of these studs is typically very difficult and time consuming due to [the] length of time they have been installed and are often damaged during the removal process. This difficulty is compounded when the removal must be performed under heat stress conditions.

The requirements of IWA-5250(a)(2) must be applied regardless of the significance of the leakage or the corrosion resistance of the materials used in the bolted connection. Implementation of code case N-566-1 permits engineering judgment to be used to evaluate the need for corrective action when leakage is discovered at a bolted connection. This code case permits factors such as the number and service age of the bolts, the bolting materials, the corrosiveness of the system fluid, the leakage location and system function, leakage history at the connection or at other system components, and visual evidence of corrosion at the bolted connection to be used to evaluate the need for corrective measures.

Relief is requested pursuant to 10 CFR 50.55a(a)(3)(i) as the application of Code Case N-566-1, with a VT-1 examination of the bolted connection to satisfy item (c)(6) of the Code Case, will provide an acceptable level of quality and safety as any leakage at mechanical connections will be thoroughly evaluated for acceptability for continued service.

Code Case N-566-1 provides alternatives to the removal of bolting from mechanical connections when leakage is discovered during a system pressure test. Factors such as the number and service age of the bolts, the bolting materials, the corrosiveness of the system fluid, the leakage location and system function, leakage history at the connection or at other system components, and visual evidence of corrosion at the bolted connection are used to determine the integrity of the bolted connection. A VT-1 visual examination will be used to provide the visual evidence of corrosion at the bolted connection pursuant to item (c)(6) of the Code Case. These alternatives provide assurance that the integrity of the mechanical joint will be maintained.

Licensee's Proposed Alternative Examination: (As stated)
When leakage is discovered at a bolted connection, the provisions of Code Case N-566-1, with a VT-1 visual examination of the bolted connection to satisfy item (c)(6) of the Code Case, will be implemented.

Evaluation: Code Case N-566-1 provides alternatives to the removal of bolting from mechanical connections when leakage is discovered during a system pressure test. Factors such as the number and service age of the bolts, the bolting materials, the corrosiveness of the system fluid, the leakage location and system function, leakage history at the connection or at other system components, and visual evidence of corrosion at the bolted connection are used to determine the integrity of the bolted connection. These alternatives provide assurance that the integrity of the mechanical joint will be maintained.

The licensee will implement the requirements of Code Case N-566-1 throughout the third 10-year inspection interval whenever leakage is discovered at a mechanical joint during the performance of system pressure tests. These requirements will include one of the following: stop the leakage and inspect the bolting and component material for joint integrity or, if the leakage is not stopped, evaluate the joint in accordance with IWB-3142.4 for joint integrity. The evaluation will include consideration of the number and condition of bolts, leaking medium, bolt and component material, system function, and leakage monitoring.

The Code requires that all bolts be removed from leaking bolted connections and that the bolts be VT-3 visual examined for corrosion and evaluated in accordance with IWA-3100. The Code requirements provide assurance that bolting corroded by system leakage will be detected and that corrective actions will be taken. However, application of the Code requirements may sometimes be unnecessary since corrosion is dependent on other factors beyond system leakage. Additionally, removal and examination of all bolts may not be necessary to assure continued integrity of the bolted connection.

The licensee noted that when an evaluation of the above elements is concluded and the evaluation determines that the leaking condition has not degraded the fasteners, then no further action is necessary. In addition, the licensee will take reasonable attempts to stop the leakage.

If the evaluation determines that an additional examination is required, the licensee proposed that the bolt closest to the leak be removed and VT-1 examined. The bolt will be evaluated per IWA-3100 which requires that the evaluation of flaws are in accordance with IWB-3000, IWC-3000, and IWD-3000 for Class 1, 2, and 3 pressure retaining components, respectively. The staff determined that removal and VT-1 examination of the bolt closest to the leak is a reasonable alternative since degradation of this bolt is most likely, and would be representative of the worst case condition of the other bolts in the subject connection. The licensee stated that if the leakage is identified when the bolted connection is in service, and the information in the evaluation is supportive, the removal of the bolt for VT-1 examination may be deferred to the next refueling outage.

Based on the items included in the evaluation process, the staff concludes that the evaluation proposed by the licensee presents a sound engineering approach. In addition, if the initial evaluation indicates the need for a more detailed analysis, the bolt closest to the source of leakage will be removed, VT-1 visually examined, and evaluated in accordance with IWA-3100(a). The VT-1 examination criteria are more stringent than the simple corrosion evaluation described in IWA-5250. Therefore, the licensee's proposed alternative provides an acceptable level of quality and safety.

For RR-A10, the staff concludes that the proposed alternative provides an acceptable level of quality and safety. Therefore, the licensee's proposed alternative to use Code Case N-566-1 is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year interval or until such time Code Case N-566-1 is referenced in a future revision of RG 1.147. At that time, if the licensee intends to continue to implement Code Case N-566-1 the licensee should follow all provisions in the subject code case with the limitations (if any) listed in RG 1.147.

2.3 RR-A16:

Code Requirement: ASME Section XI, 1995 Edition, 1996 Addenda, Appendix VII, Paragraph VII-4240 requires a minimum of 10 hours of annual training.

10 CFR 50.55a(b)(2)(xiv) requires that all personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII shall receive 8 hours of annual hands-

on-training on specimens that contain cracks. This training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(a)(3)(i), relief is requested from the provisions of 10 hours of annual training contained in Paragraph VII-4240, Appendix VII of ASME Section XI.

Licensee's Basis for Requesting Relief: (As stated)
Paragraph VII-4240 requires 10 hours of annual training. 10 CFR 50.55a(b)(2)(xiv) requires that all personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII shall receive 8 hours of annual hands-on training on specimens that contain cracks. This training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility.

Paragraph 2.4.1.1.1 in the *Federal Register (Volume 64, No. 183 dated September 22, 1999)* contained the following statement:

> The NRC had determined that this requirement (10 hours of training on an annual basis) was inadequate for two reasons. The first reason being that the training does not require laboratory work and examination of flawed specimens. Signals can be difficult to interpret and, as detailed in the regulatory analysis for the rulemaking, experience and studies indicate that the examiner must practice on a frequent basis to maintain the capability for proper interpretation. The second reason is related to the length of training and its frequency. Studies have shown that an examiner's capability begins to diminish within approximately 6 months if skills are not maintained. Thus, the NRC had determined that 10 hours of annual training is not sufficient practice to maintain skills, and that an examiner must practice on a more frequent basis to maintain proper skill level. The PDI program has adopted a requirement for 8 hours of training, but it is required to be hands-on practice. In addition, the training must be taken no earlier than 6 months prior to performing examinations at a licensee's facility. PDI believes that 8 hours will be acceptable relative to an examiner's abilities in this highly specialized skill area because personnel can gain knowledge of new developments, material failure modes, and other pertinent technical topics through other means. These changes are reflected in 50.55a(b)(2)(xiv).

Implementation of the requirements contained in both paragraph VII-4240 of ASME Section XI and 10 CFR 50.55a will result in redundant systems. The use of the 10 CFR 50.55a requirements only will simplify record keeping, satisfy needs for maintaining skills, and provide an acceptable level of quality and safety.

Licensee's Proposed Alternative Examination: (As stated)
Annual ultrasonic training shall be conducted in accordance with 10 CFR 50.55a(b)(2)(xiv) in lieu of the 1995 Edition, 1996 Addenda of ASME Section XI, Appendix VII, Paragraph VII-4240.

Evaluation:
Subsubarticle VII-4240, Appendix VII of Section XI of the Code requires 10 hours of annual training to impart knowledge of new developments, material failure modes, and any pertinent technical topics as determined by the licensee. No hands-on training or practice is required to be included in the 10 hours of training. This training is required of all ultrasonic test (UT) personnel qualified to perform examinations of ASME Code Class 1, 2, and 3 components. Independent of the ASME Code, 10 CFR 50.55a(b)(2)(xiv) imposes the requirement for Appendix VIll qualification that 8 hours of hands-on training with flawed specimens containing cracks be performed no earlier than 6 months prior to performing examinations at a licensee's facility. The licensee contends that maintaining two separate UT annual training programs for Appendix VIll and non-Appendix VIll qualifications create redundancies in training programs.

As part of the staff's rulemaking effort to revise 10 CFR 50.55a(b)(2), the issue of UT annual training requirements was reviewed. This review was included in the summary of comments to the rule that was published in the *Federal Register* on September 22, 1999, (64 FR 51370). In the review, the staff determined that the 10 hours of annual training requirement specified in the ASME Code was inadequate for the two reasons quoted in the licensee's basis for relief (Section 2.3 above). In resolving public comment to the rulemaking, the staff adopted a recommendation advanced by the nuclear power industry which proposed 8 hours of hands-on practice with specimens containing cracks. This practice would occur no earlier than 6 months prior to performing examinations at a licensee's facility. These recommendations were accepted by NRC and are reflected in 10 CFR 50.55a(b)(2)(xiv). The staff has determined that the proposed alternative to use 10 CFR 50.55a(b)(2)(xiv) in lieu of Subsubarticle VII-4240 will maintain the skill and proficiency of UT personnel at or above the level provided in "the Code for annual UT training," thereby, providing an acceptable level of quality and safety.

For RR-A16, the staff concludes that the proposed alternative 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) for the third 10-year interval.

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Date: September 27, 2002