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July 6, 2005
JAFP-05-0102

Mr. James Dyer
Director, Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, Maryland 20852

Subject: **James A. FitzPatrick Nuclear Power Plant**
Docket No. 50-333
Request for Approval of Relief Request No. RR-37, Alternative Test per 10 CFR 50.55a(a)(3)(i) from the 1998 Edition of ASME Section XI as supplemented by the 1992 Edition ASME Section XI through 1992 Addenda for Repair/Replacement Activities, IWE-5221, Tests Following Repair/Replacement Activities and Section III, NE-5200, Required Examination of Welds

Reference: 1. Letter, S. Singh Bajwa to J. Knubel, dated September 21, 1998, "James A. FitzPatrick Nuclear Power Plant - Alternative Testing of Containment Following Emergency Core Cooling System (ECCS) Suction Strainer Replacement (TAC No. MA2472)"

Dear Sir:

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy Nuclear Operations, Inc. (ENO) is submitting a relief request (Attachment 1) to perform an alternative test to that specified by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1998 Edition, Subsection IWE-5221 and as supplemented by the 1992 Edition, 1992 Addenda of IWA-4000 for repair/replacement activities, as required under the James A. FitzPatrick Containment Inservice Inspection Program. Relief is also requested from the radiographic examination requirements of Section III Subsection NE-5200, Subparagraph NE-5220.

The James A. FitzPatrick Nuclear Power Plant (JAF) is performing a repair to a through wall crack in the torus shell. The torus is an In-Service Inspection (ISI) Class MC component and is, therefore, subject to the pressure test requirements of IWE-5221 and the radiographic examination requirements of NE-5220.

ENO requests approval of the proposed relief request by July 7, 2005, to support the present repair schedule.

A similar relief request for pneumatic testing was approved for JAF by the NRC in 1998 (Reference 1).

There is one new commitment made in this letter as noted in Attachment 2. Should you have any questions or comments concerning this submittal, please contact Mr. Rick Plasse at (315) 349-6793.

Sincerely,

T. A. Sullivan
Site Vice President

Attachments:

1. Relief Request No. RR-37, Alternative Test per 10 CFR 50.55a(a)(3)(i) from the 1998 Edition of ASME Section XI as supplemented by the 1992 Edition ASME Section XI through 1992 Addenda for Repair/Replacement Activities, IWE-5221, Tests Following Repair/Replacement Activities and Section III, NE-5200, Required Examination of Welds
2. Summary of Regulatory Commitments

cc: Regional Administrator, Region I
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Attachment 1 to JAFP-05-0102
Entergy Nuclear Operations, Inc. – FitzPatrick
Docket No. 50-333

Relief Request No. RR-37, Alternative Test per 10 CFR 50.55a(a)(3)(i) from the 1998 Edition of ASME Section XI as supplemented by the 1992 Edition ASME Section XI through 1992 Addenda for Repair/Replacement Activities, IWE-5221, Tests Following Repair/Replacement Activities and Section III, NE-5200, Required Examination of Welds

INTRODUCTION

Pursuant to 10 CFR 50.55a(a)(3)(i), the James A. FitzPatrick Nuclear Power Plant (JAF) requests approval of a relief request to perform an alternative test to that specified by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, IWE-5221. The torus is an In-Service Inspection (ISI) Class MC component and is, therefore, subject to the requirements of IWE-5221. Relief is also requested from the radiographic examination requirements of Section III Subsection NE-5200, Subparagraph NE-5220.

JAF is repairing a through wall crack in the torus shell by performing an ASME Section XI Code repair. The repair consists of welding a plate over the area where the flaw is located and completely removing the flaw, thereby restoring the integrity of the containment structure. The proposed repair plate is approximately 13 inches in diameter and will be installed on the exterior of the torus shell below the normal torus water level. The area with the flaw noted will be removed to allow further cause evaluation.

The welded plate will be coated on the inside surface with corrosion resistant coating during the next refuel outage (fall 2006).

A. ASME CODE COMPONENT AFFECTED

The torus is classified as an ASME ISI Class MC, Examination Category E-A, Item No. E1.10, Containment Vessel - Torus.

The torus is a steel pressure vessel designed, fabricated and tested to the requirements for Class B vessels in the 1968 Edition of Section III of the ASME B&PV Code. The torus plate conforms to ASME SA-516, Grade 70 steel.

B. APPLICABLE CODE EDITION AND ADDENDA

The Code of Record for the JAF Containment Inservice Inspection Program is the 1998 Edition, No Addenda of ASME Section XI Code, as supplemented by the 1992 Edition, 1992 Addenda, Subsection IWA-4000 for repair/replacement activities (Reference 1, JAF Relief Request No. RR-27, TAC No. MB2946, dated May 1, 2002).

Relief Request No. RR-37, Alternative Test per 10 CFR 50.55a(a)(3)(i) from the 1998 Edition of ASME Section XI as supplemented by the 1992 Edition ASME Section XI through 1992 Addenda for Repair/Replacement Activities, IWE-5221, Tests Following Repair/Replacement Activities and Section III, NE-5200, Required Examination of Welds

C. APPLICABLE CODE REQUIREMENT

The JAF Containment Inservice Inspection Program Plan, JAF-RPT-PC-04088, Rev. 5 (Reference 2) is developed to the requirements of the 1998 Edition of the ASME Section XI Code, and as supplemented by the 1992 Edition, 1992 Addenda (92E/92A) for repair/replacement activities (Reference 2, Section 3.10, page 21 of 24).

Subsection IWE-4000 of 92E/92A states repairs/replacement shall be performed per IWA-4000. IWA-4550, Class MC and Metallic Portions of Class CC components, states that "*Items subjected to repair/replacement activities shall be tested in accordance with IWE-5000.*" JAF had previously received approval to use the 1998 Edition of Subsection IWE (Reference 1). Therefore, in accordance with the 1998 Edition of the ASME B&PV Code, Section XI, for Class MC components, Article IWE-5000, Subsection IWE-5220, "Tests Following Repair/Replacement Activities," subparagraph IWE-5221, "Leakage Test," would apply which states that:

> "Except as noted in IWE-5222, repair / replacement activities performed on the pressure retaining boundary of Class MC or Class CC components shall be subjected to a pneumatic leakage test in accordance with the provisions of Title 10, Part 50 of the Code of Federal Regulations, Appendix J, Paragraph IV.A."

10 CFR 50, Appendix J, Paragraph IV.A states:

> "Any major modification, replacement of a component which is part of the primary reactor containment boundary, or resealing a seal-welded door, performed after the preoperational leakage rate test shall be followed by either a Type A, Type B, or Type C test, as applicable for the area affected by the modification. The measured leakage from this test shall be included in the summary report required by V.B. The acceptance criteria of III.A.5.(b), III.B.3, or III.C.3., as appropriate, shall be met. Minor modifications, replacements, or resealing of seal-welded doors, performed directly prior to the conduct of a scheduled Type A test do not require a separate test."

Paragraph IWE-5221 requires a pneumatic leakage test following repair of the pressure retaining boundary of a Class MC component, such as the torus. This pneumatic leakage test for a repair on the torus is a Type A Integrated Leakage Rate Test (ILRT) on the primary containment, since the repair is not associated with either a containment penetration (Type B Test) or a containment isolation valve (Type C Test). Pursuant to 10 CFR 50.55a(a)(3)(i), alternative testing and relief is requested from the requirements of Article IWE-5000, paragraph IWE-5221 of the 1998 Edition of ASME Section XI.

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Section III, Paragraph NE-5220 of the ASME Code requires 100% volumetric examination by radiography for the Code repair. Pursuant to 10 CFR 50.55a(a)(3)(i), alternative testing and relief is requested from the requirements of Section III, paragraph NE-5220 of the ASME Code.

D. REASON FOR REQUEST

The intent of 10 CFR 50 Appendix J is to ensure that the potential leakage of containment air to the atmosphere following a design basis accident is maintained below established limits by the performance of pneumatic leakage tests. The typical Type A ILRT requires extensive preparation in terms of system line-ups and installation of temporary instrumentation, as well as a minimum of 24 hours of pressure stabilization and temperature equalization, followed by leakage testing and verification at all penetrations in the containment structure. The repair of the crack in the torus shell will not impact air leakage out of the containment and its penetrations. As the repair area is located completely underwater, it is water sealed against any potential air leakage. The concerns relating to repair of the torus shell are those of pressure vessel structural integrity and water leak tightness. The leakage testing requirements of 10 CFR 50, Appendix J, Option B are not directly related to the proposed repair, and an exemption to Appendix J or a TS change is not required. Therefore, an alternative test at a test pressure of 45 psig and a hold time of a minimum of one hour is requested.

In order to perform a 100% volumetric radiographic examination of the repair weld area it would be necessary to completely remove the torus support column and internal structural members adjacent to the repair area. Such removal would require welding additional supports onto the torus to temporarily support the torus structure and underwater removal of the internal structural members while performing the radiography. In view of the additional examinations proposed below, the removal of the support column to gain full radiography access does not result in a significant increase in the quality of the repair.

E. PROPOSED ALTERNATIVE AND BASIS FOR USE

The proposed alternative test is to pressurize the containment air volume to a minimum of 45 psig, hold that pressure for a minimum of one hour while performing a VT-2 examination of the repair area for water leakage and structural integrity. This test pressure is chosen, as specified in TS Bases Section B 3.6.1.1, since it is the peak primary containment internal pressure for the design basis loss of coolant accident (LOCA). The TS Bases refer to UFSAR Sections 5.2 and 14.6.1.3, both of which also discuss the 45 psig peak primary containment pressure. This test will subject the repair area to both the 45 psig containment air pressure and the static pressure of the standing head of water associated with the torus water level limits specified in the TS (i.e., 13.88 feet to 14.00 feet).

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Due to the interference from the adjacent support column and internal structural members which precludes full access to perform 100% radiography of the weld, it is proposed to, (1) perform radiography, to the extent possible, on that portion of the weld that can be accessed without removal of the torus support column and internal structural members (approximately 40% of the total weld area), (2) perform surface examination of the root pass and the final weld, and (3) perform visual examination of each pass of the weld including the final weld.

Basis for Use

The proposed alternative pressure test (at 45 psig with a minimum one hour hold time) is justified in conjunction with the engineering controls and non-destructive testing that will be performed with the torus shell repair. This includes radiography to the maximum extent possible; surface examination of the root pass and final weld; and visual examination of each pass and the final weld.

All NDE examinations will be performed per ASME Section III 1998 Edition, No addenda, except as relief is granted pursuant to this request.

The torus shell repair consists of attaching a new plate to the torus shell. The new plate material will be fabricated to meet, as a minimum, the same specifications as the existing torus shell and will be curved to match the radius of the torus shell at the location of the repair.

The shell repair will be performed in accordance with the 1992 Edition with the 1992 Addenda of Section XI Subsection IWE of the ASME Code.

The weld will be performed utilizing a welding procedure specification and materials qualified to meet notch toughness requirements of the original code of construction. In addition, prior to performing the repair activity, a mock-up exercise was performed and examined to demonstrate weld technique and quality. This will assure that the integrity of the weld meets or exceeds current industry standards as well as that of the existing torus shell. Industry experience has shown that the current state of the art non-destructive testing techniques provide an accurate determination of the integrity of structural welds.

Since the repair material will not be coated on the inside of the torus until the next refueling outage JAF evaluated the potential effects of corrosion on the repair material. Historically, torus water is typically 200-1000 ppb dissolved oxygen and temperature is maintained in a range of range of 68 - 95°F. The general corrosion rate of carbon steel for these conditions is conservatively <1000 mg/dm^2-mo per NEDO-13168, "Corrosion and Corrosion Product Release In Neutral Feedwater" dated December 1970 (Reference 3). For the projected operating period until the repair is coated in Refueling Outage 17 (15 months), general corrosion is conservatively estimated to be < 1.0% of wall thickness. Therefore, the deferral of coating will not result in a significant degradation of the repair surface.

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The performance of a pressure test on the containment at the design LOCA pressure of 45 psig, for a minimum hold time of one hour after which a VT-2 inspection will be performed in accordance with the 1992 Section XI Code requirements, provides an acceptable level of assurance of the quality of the repair and adequately demonstrates the structural integrity of the containment. The additional NDE examinations performed as described above will further ensure the integrity of the repair area. Therefore, the proposed alternative pressure test and NDE examinations provide an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

F. DURATION OF PROPOSED ALTERNATIVE

This is a one time relief from the pneumatic leakage test requirements of IWE-5221 and the radiographic examination requirements of NE-5220 for the torus repair.

G. REFERENCES

1. NRC SER Regarding Alternative to the ASME B&PV Code to Use the 1998 Edition of Subsection IWE of the ASME Section XI for Containment Inspections (TAC No. MB2946), dated May 1, 2002.
2. JAF Containment Inservice Inspection Program Plan, JAF-RPT-PC-04088, Rev. 5.
3. NEDO-13168, "Corrosion and Corrosion Product Release In Neutral Feedwater", dated December, 1970.

Attachment 2 to JAFP-05-0102
Entergy Nuclear Operations, Inc. – FitzPatrick
Docket No. 50-333

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This table identifies actions discussed in this letter for which Entergy commits to perform. Any other actions discussed in this submittal are described for the NRC's information and are not commitments.

Commitment	TYPE (Check One)		Scheduled Completion Date
	One Time Action	Continuing Compliance	
Perform coating of the repair inside the torus.	X		RO-17