

July 8, 2005

Mr. Michael Kansler
President
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - RELIEF REQUEST FOR
ALTERNATIVE TESTING OF CONTAINMENT FOLLOWING REPAIRS TO THE
TORUS (TAC NO. MC7508)

Dear Mr. Kansler:

By letter dated July 6, 2005, Entergy Nuclear Operations, Inc. (Entergy) submitted a relief request, which proposed alternative testing following a containment repair. By letter dated July 7, 2005, Entergy submitted additional information as requested by the Nuclear Regulatory Commission (NRC) staff during a telephone conference on July 7, 2005. Entergy requested relief from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Section XI, subsection IWE-5221. The request was made pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 55a(a)(3)(I).

As documented in the enclosed safety evaluation, the NRC staff has reviewed your submittal and concludes that your alternative program provides an acceptable level of quality and safety, and is an acceptable alternative to the requirements stated in subsection IWE-5221 of the ASME Code, Section XI. Therefore, pursuant to 10 CFR 50.55a(a)(3)(I), the alternative is authorized.

If you have any questions regarding this matter, please contact John Boska, the NRC project manager for FitzPatrick, at 301-415-2901.

Sincerely,

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-333

Enclosure: As stated

cc w/encl: See next page

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Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO RELIEF REQUEST FOR ALTERNATIVE TESTING
OF CONTAINMENT AFTER REPAIRS TO THE TORUS
ENTERGY NUCLEAR OPERATIONS, INC.
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
DOCKET NO. 50-333

1.0 INTRODUCTION

Entergy Nuclear Operations, Inc. (Entergy or the licensee), the licensee for the James A. FitzPatrick Nuclear Power Plant (JAF), is repairing a through-wall crack in the torus shell by performing an American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Section XI 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 will be removed to allow further evaluation of the cause of the flaw.

By letter dated July 6, 2005 (Reference 5.1), as supplemented by a letter dated July 7, 2005 (Reference 5.2), Entergy requested relief from certain requirements of Section XI and Section III of the ASME Code for performing weld repair, and post repair pressure testing of the containment. This evaluation addresses the merits of the requested relief pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 55a(a)(3)(I).

2.0 REGULATORY EVALUATION

In accordance with 10 CFR 50.55a(g)(4), ASME Code Class MC components must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of the ASME Code to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that Class MC components 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 ISI interval. For JAF, the code of reference for containment inservice inspection (ISI) is the 1998 Edition, as supplemented by the requirements of the 1992 Edition and the 1992 Addenda for repair and replacement activities. The relief is requested from certain requirements of Section III and Section XI of the ASME Code, pursuant to 10 CFR 50.55a(3)(I)

3.0 TECHNICAL EVALUATION

3.1 Relief Request (RR)-37 (part 1) - Relief from ASME Code Section III, Subsubarticle NE-5220.

3.1.1 ASME Code Component Affected

Primary containment 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 code. The torus plate conforms to ASME SA-516, Grade 70 steel.

3.1.2 Applicable ASME Code Requirement

In reference 5.1, the licensee applied Subsubarticle NE-5220 of Section III of the ASME Code for repair weld examination. NE-5220 requires 100% volumetric radiographic testing (RT) of the repair weld area when categorized as Category A butt weld. The license requested relief from performing 100% RT.

3.1.3 Reason for Relief Request

In order to perform a 100% RT 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 alternate examinations proposed, the removal of the support column to gain full access for RT does not result in a significant increase in the quality of the repair.

3.1.4 Proposed Alternative

In lieu of the 100% RT of the repair weld area, the licensee has proposed to (1) perform RT 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 a surface examination of the root pass of the final weld, and (3) perform visual examinations of each pass of the weld including the final weld.

3.1.5 Nuclear Regulatory Commission (NRC) Staff Evaluation

By letter dated July 7, 2005, in response to the NRC staff's questions regarding the categorization of the proposed weld, the licensee assessed the appropriate categorization of the repair weld, and came to the following determination:

Based on review of the code of record for the Mark 1 containment upgrades, ASME Section III, Subsection NE (1974 Edition through Summer 1977 Addenda), paragraph NE-3350 addresses the design of welded connections and categorizes weld joints into Categories 'A' through 'D'. Paragraph NE-3351.4 defines Category 'D' weld joints to include nozzles attaching to the main shells. The repair cap weld joint is in the form of a nozzle connection and therefore, is classified as an ASME Section III, Subsection NE Category 'D' weld joint. The

weld joint type has been classified as a full penetration corner weld. As such per NE-5242 surface examination is required but radiography is not. Therefore, no relief from the code requirements is required and JAF is withdrawing that portion of Relief Request No. RR-37.

Based on this determination, the licensee withdrew this part of the relief request. The NRC staff finds the licensee's weld categorization acceptable, and all the examination requirements of NE-5242 are applicable for the repair weld area.

3.2 RR-37 (Part 2) - Pressure Testing of Torus after Repair

3.2.1 ASME Code Component Affected

Primary containment torus is the component affected by the relief request. 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 Code. The torus plate conforms to ASME SA-516, Grade 70 steel. The torus is classified as an ASME Code ISI Class MC.

3.2.2 Applicable ASME Code Requirement

The ASME Code of Record for the JAF Containment Inservice Inspection Program is the 1998 Edition, of the ASME Code Section XI, as supplemented by the 1992 Edition, 1992 Addenda, Subsection IWA-4000 for repair/replacement activities. The licensee describes the relevant Code requirement as follows:

The JAF Containment Inservice Inspection Program Plan, JAF-RPT-PC-04088, Rev. 5 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.

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:

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.

3.2.3 Reason for Relief Request

The licensee provided the following reason for justifying the relief 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 [Technical Specification] 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.

3.2.4 Proposed Alternative

The licensee described the alternative as follows:

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 [visual] 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 [Updated Final Safety Analysis Report] 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).

3.2.5 NRC Staff Evaluation

The staff's basic focus related to the proposed alternative is the adequacy of the alternative test to locate leakages in other parts (other than the torus repair areas) of the primary containment. The licensee plans to pressurize the entire primary containment (the drywell, the torus, and the connecting vents) to the containment peak calculated pressure. The licensee will be pressurizing the containment at a rate that will take a minimum of three hours to reach the peak pressure of 45 psig. If any significant leakage is taking place from other parts of the containment, it will be apparent during the pressurization, and during the hold period of more than one hour. In response to a staff question regarding the general visual examination of the containment, the licensee asserted that, as per its procedure, TST-87, "Primary Containment Pressure Test," all the accessible portions of the containment will be subjected to general visual examination after the hold period, but prior to the start of depressurization. On the basis that the pressure test will detect major defects in the repair weld area and general significant leakage from the containment, the staff finds the licensee proposed alternative acceptable.

4.0 CONCLUSION

The NRC staff finds the re-categorization of the repair weld design acceptable. The licensee is required to follow the code requirement for examination of the weld repair area. The staff finds the alternative proposed in lieu of the requirement of Subsubarticle IWE-5220 of Section XI of the ASME Code regarding the pressure testing of the containment acceptable as the alternative test will detect major defects in the weld repair area. The staff concludes that authorization of the licensee's alternative program provides an acceptable level of quality and safety, and is, therefore, acceptable. Pursuant to 10 CFR 50.55a(a)(3)(I), the alternative is authorized.

5.0 REFERENCES

- 5.1 Letter from T.A. Sullivan (Entergy) to NRC, "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," dated July 6, 2005.
- 5.2 Letter from T.A. Sullivan (Entergy) to NRC, "Request for Additional Information on Relief Request No. RR-37," dated July 7, 2005.

Principal Contributor: Hans Ashar

Date: July 8, 2005