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U.S. Nuclear Regulatory Commission
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Subject: James A. FitzPatrick Nuclear Power Plant (Relief Request #30)
Docket 50-333
Proposed Alternatives In Accordance with 10CFR50.55a(g)(6)(ii)(A)(5) and Relief From ASME Section XI Code Regarding Inspection of RPV Vertical Shell Welds pursuant to 10 CFR 50.55a (g)(6)(i)

Reference:
1. NYPA Letter to USNRC, (JPN-99-026), "Proposed Alternatives in Accordance with 10CFR50.55a(a)(3)(i) and Relief From ASME Section XI Code Regarding Inspection of RPV Vertical Shell Weld and Shell to Flange Welds" (Relief Requests #18 and #19), dated August 5, 1999.

2. NRC letter, "Relief Requests Nos. 18 and 19-For Augmented Inspection of the Axial Shell Welds and for Inspection of the Vessel Shell-to-Flange Weld in the Reactor Vessel of the James A. FitzPatrick Nuclear Power Plant (TAC No. MA6270)", dated February 29, 2000.

3. Entergy letter to USNRC, (JAFP-01-0262), "Status Report on Tooling Development Alternatives in Accordance with 10CFR50.55a(a)(3)(i) and Relief from ASME Section XI Code Regarding Inspection of RPV Vertical Shell Welds-(Relief Request No. 18), dated December 20, 2001.

Dear Sir:

This letter transmits Relief Request #30 to the James A. Fitzpatrick (JAF) Inservice Inspection Program.

On August 5, 1999, (Reference 1) the New York Power Authority (NYPA) submitted Relief Request No. 18 requesting relief to defer performing the augmented inspection of the axial shell welds in the Reactor Pressure Vessel (RPV) of the James A. FitzPatrick Nuclear Power Plant (JAFNPP) until refueling outage 16 (RO16) during the fourth quarter of the year 2004. These inspections are required pursuant to 10 CFR 50.55a(g)(6)(ii)(A)(2). The augmented inspection

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provisions of the rule require that the augmented inspection cover at least 90 percent of the volume of each weld scheduled for examination. The basis for the deferral was to allow development of new volumetric examination technology (i.e. "new generation" tooling) to allow performance of RPV vertical shell weld examinations to the maximum extent possible, close to or exceeding 90 percent coverage of the vertical shell welds in the belt-line region.

Entergy provided a status report of the "new generation" tooling (Reference 3) which had been successfully developed to support the JAFNPP inspection plan scheduled for completion in RO16.

During refueling outage 15 (RO15) in the fourth quarter of the year 2002 Entergy completed Phase I of the inspection plan utilizing the outside diameter (OD) inspection tooling. Entergy will complete Phase II of the inspection plan utilizing the inside diameter (ID) inspection tooling during RO16. All axial RPV shell welds will be examined to the maximum extent possible. For all axial welds, where less then 90 percent total coverage is achieved Entergy requests additional relief.

Detailed examination information is contained in Attachment 1 along with Entergy's best estimate of the examination coverage for each RPV axial weld, in Attachment 2. The attachment shows that with the "new generation" tooling the average percent total coverage of the twelve RPV axial shell welds is approximately 75 percent. The total percent coverage represents the combined examination from the outside and inside surfaces of the RPV. Entergy will provide additional NRC notification after completion of RO16 if any examination coverage is significantly different from these estimates.

Based on the information contained in Attachment 1 and 2, these examinations provide reasonable assurance that unacceptable service-induced flaws have not developed in these welds and that the RPV shell weld integrity is maintained. These examinations have or will be performed to the maximum extent practical using "new generation" tooling and techniques within the limitations of design and access of the RPV, and the resultant coverage (approximately 75 percent) provides an acceptable level of this alternative RPV shell weld examination for the JAFNPP in accordance with the provisions of 10 CFR 50.55a(g)(6)(ii)(A)(5).

Attachment 1 contains the basis for Relief Request 30. Entergy would like to use this relief in the upcoming refueling outage (RO16) and therefore request approval of this relief request prior to May 10, 2004.

This letter contains no new commitment. If you have any questions, please contact Mr. Andrew Halliday at 315-349-6055.

Very truly yours,

Ted Sullivan
Site Vice President

cc: Regional Administrator, Region I
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Attachment 1 to JAFP-03-0111

Relief Request #30

Relief Request Regarding Augmented Inspection of Reactor Pressure Vessel Vertical Shell Welds

Entergy Nuclear Operations
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
DOCKET NO. 50-333

Attachment 1
JAFP-03-0111

Relief Request #30
Relief Request from ASME Section XI Code Regarding Reactor Pressure Vessel Vertical Shell Welds

Background:

10CFR 50.55a(g)(6)(ii)(A)(2) states that all licensees shall augment their reactor vessel examinations by implementing the examination requirements for Reactor Pressure Vessel (RPV) shell welds specified in item B1.10 of Examination Category B-A, "Pressure Retaining Welds in Reactor Vessel," in Table IWB-2500-1 of Subsection IWB of the 1989 Edition of Section XI, Division 1, of the ASME Boiler and Pressure Vessel Code, subject to the conditions specified in 50.55a(g)(6)(ii)(A)(3) and (4). As stated in 10CFR50.55a(g)(6)(ii)(A)(2) for the purposes of this augmented examination, essentially 100 percent as used in Table IWB-2500-1 means more than 90 percent of the examination volume for each weld. Additionally, 10CFR50.55a(g)(6)(ii)(A)(5) requires licensees that are unable to completely satisfy the augmented RPV shell weld examination requirements to submit information to the U.S. Nuclear Regulatory Commission to support the determination, and propose an alternative to the examination requirements that would provide an acceptable level of quality and safety. JAF is unable to obtain essentially 100% of each vertical weld without disassembly or removal of internal interferences, removal of the permanently installed bio-shield, or to spend additional efforts and personnel radiation exposure in pursuing further examinations from the vessel OD as in RO15, which would result in hardship and unusual difficulty without a compensating increase in the level of quality and safety. JAF's intention is to continue the review and evaluation of methods to allow accessibility to greater than 90% of each of the vertical RPV shell welds in the belt-line region. However Welds VV-3A and VV-3C, previously planned to be accessed for inspection from vessel OD, will now be accessed from the ID side only. The ID access to these welds, will be partially limited by the core spray and feedwater headers, the guide bar attachment bracket and the core spray downcomers. The alternative plan per allowances of 10CFR50.55a(g)(6)(ii)(A)(5) would be a best effort examination expected to yield total belt-line and total axial weld coverage close to or exceeding the coverage obtained by most plants within the BWR domestic fleet.

The purpose of this letter is to request approval, pursuant to provisions contained in 10CFR50.55a(g)(6)(i) based on the code requirements being impractical, an alternative plan for performing the reactor pressure vessel (RPV) augmented examination requirements of 10CFR55a(g)(6)(ii)(A)(2) for the James A. FitzPatrick Nuclear Power Plant (JAF).

A. Component Identification:

ISI Class 1, Code Category B-A, "Pressure Retaining Welds in Reactor Vessel", Item B1.12, "Longitudinal Shell Welds".

B. Examination Requirements:

10CFR 50.55a(g)(6)(ii)(A)(2) states that all licensees shall augment their reactor vessel examinations by implementing the examination requirements for Reactor Pressure Vessel (RPV) shell welds specified in item B1.10 of Examination Category B-A, "Pressure Retaining Welds in Reactor Vessel," in Table IWB-2500-1 of Subsection IWB of the 1989 Edition of Section XI, Division 1, of the ASME Boiler and Pressure Vessel Code, subject to the conditions specified in 50.55a(g)(6)(ii)(A)(3) and (4). As stated in 10CFR50.55a(g)(6)(ii)(A)(2) for the purposes of this augmented examination, essentially 100 percent as used in Table IWB-2500-1 means more than 90 percent of the examination volume for each weld. Additionally, 10CFR50.55a(g)(6)(ii)(A)(5) requires licensees that are unable to completely satisfy the augmented RPV shell weld examination requirement to submit information to the U.S. Nuclear Regulatory Commission to support the determination, and propose an alternative to the examination requirements that would provide an acceptable level of quality and safety.

C. Alternative To The Examination Requirements:

The alternative plan would complete Phase II examination in RO16 of the vertical shell welds from vessel ID. This will complement the coverage obtained in RO15 from vessel OD. The combined ID/OD access coverage is expected to meet or to exceed the coverage obtained by most domestic plants within the BWR Combustion Engineering (CE) manufactured Reactor Vessel fleet. RO16 is currently scheduled for fourth quarter 2004. There are a large number of RPV internal obstructions/interferences which prevent achieving the "essentially 100%" coverage requirements of 10CFR50.55a(g)(6)(ii)(A) "Augmented Examination of Reactor Vessel". The estimated coverage with use of conventional tooling was in the range of 51% to 64% for all vertical welds and 33% to 52% for belt-line region vertical welds. Industry average for the BWR CE Fleet is approximately 60% of total weld length and belt-line (Reference 1). However, with the use of "new generation" tooling (Reference 3) JAF expects to obtain belt-line region axial weld coverage of approximately 63%, and total axial weld coverage of approximately 75%, results higher than the industry average, (see Attachment 2).

D. Basis For Alternative Plan:

JAF is unable to meet the greater than 90% coverage requirement for each weld due to internal interference of the reactor vessel components. The alternative plan with the new improved tooling technology, will enable scanning of welds in confined areas not accessible by conventional tooling.

The industry basis document, BWRVIP-05 (Reference 4), considered several issues related to

BWR RPV integrity to provide a basis for eliminating the requirement to perform circumferential weld exams and the performance of only 50 % of the vertical RPV shell weld exams. These issues included fabrication practices, in-service inspection data, operational issues, degradation mechanics, and probabilistic fracture mechanics analysis results. As stated in the report "Results of the evaluation performed in this report clearly demonstrate the inherent safety and integrity of BWR reactor pressure vessels." The following basis provides plant specific data to justify weld coverage lower than the required "essentially 100%".

Previous Shell Weld Examinations:

During the fabrication process of the RPV, the shell welds were thoroughly examined using several examination methods as required by the original construction code. Additionally, all of the shell welds received volumetric examination prior to initial plant operations, as prescribed by ASME Section XI pre-service inspection requirements.

A search of original construction "weld travelers" records identified among others, a Report of Ultrasonic Testing for Vessel Assembly dated 4/10/71, stating "UT of Pressure Boundary Welds. No Indications Reportable"; and a Shop Quality Control, Inspection and Document Record document (by Stone and Webster), with a listing of performed and checked tests, dated 9/16/70. All shell weld original radiographs have been digitized per latest EPRI guidelines. The digitized radiographs, for the vertical welds in the belt-line region, were reviewed by a JAFNPP QA Level III inspector. The review identified minor inclusions/slag/porosity randomly oriented throughout the welds. These indications are considered minor with no safety significance. These radiographs were accepted during original vessel fabrication.

Selected shell welds have received outer diameter (OD) volumetric examinations during the first and second interval in accordance with ASME Section XI in-service inspection requirements. The OD examination totaled 28% of total vertical length of shell welds with 12% at belt-line vertical welds. Most of the intersecting welds, 10 of 15, were inspected. Some welds only received partial coverage (i.e., one sided examination coverage only). The OD examinations resulted in only four recorded spot indications, with no measurable length or width. These indications were found acceptable for operation.

Two welds were examined in RO15 (Phase I) from vessel OD with coverage in weld length as follows:

Weld Designation No:	Total %Coverage:	Belt-Line % Coverage:
VV-4A	73	91
VV-4B	73	91

The intent of the Phase I inspection was to increase belt-line coverage to "close to or exceed 90%". Phase I inspection plans were to examine four axial welds (VV-4A, VV-4B, VV-3A, and VV-3C) by UT method with access from the vessel outer diameter (OD). However, limited tooling access through biological shield wall openings, high dose rates, and personnel radiation

exposure allowed only two axial welds (VV-4A, VV-4B) to be examined. These particular welds were not accessible from the ID either by conventional tooling or state-of-the art tooling (i.e., other methods would result in zero coverage). To allow the OD exams and to develop the necessary OD UT tooling, required significant resources and personnel radiation exposure in RO14 (measurements for tooling development) and RO15 (actual OD Phase I, ISI exams). Actual total personnel radiation exposure received to support these two weld exams was 14.23 REM. Based on this, Entergy determined that performing additional exams from the OD presents hardship and unnecessary personnel radiation exposure. Unlike the two inspected welds (VV-4A, VV-4B), VV-3A and VV-3C are accessible from the ID and have been added to the Phase II exams. This will result in less total coverage and less belt-line coverage, but will result in a significant personnel radiation dose exposure savings of at least 5.9 REM.

Industry Results of Past Examinations:

As identified in Reference 1, a substantial amount of examinations have been performed on the BWR Fleet that verify the integrity of BWR vessels. Only a negligible number of construction related indications have been detected as a result of these inspections with no service related defects.

RPV Internal Obstructions/Interferences

Typical vertical weld coverage achieved on BWR CE Plants, is approximately 60% average for belt-line and non-belt-line welds. The low coverage is attributed to RPV internal obstructions. No domestic plant has removed these obstructions to increase weld inspection coverage.

The internal obstructions/ interferences at JAF are listed below:

1. Jet pump assemblies, support plates and gussets restrict access to at least three vertical welds;
2. Some of the core shroud repair tie-rods restrict access to at least two vertical welds. (JAF has installed a 10 tie-rod system);
3. Feedwater sparger and core spray piping restrict significant coverage to at least three vertical welds;
4. Guide rod at 180° restricts access to two vertical welds located at the same azimuth;
5. Steam dryer brackets obstruct local access for two welds; and others such as the surveillance specimen holder, etc.

Removal of obstructions/vessel internals would involve substantial risk and possible damage to the vessel inside wall, and would create the potential for loose parts (i.e., metal shavings that could cause fuel damage). Such removal would involve a significant amount of person-hours of direct labor with severe impact to the outage schedule, an economic impact, and a substantial increase in personnel radiation exposure, without a compensating increase in safety.

Conclusion:

Based on the documentation in the BWRVIP-05 report, the lower neutron fluence than the

leading plants (Reference 4), the less challenging design and operational loading for BWRs, the quality of the original vessel fabrication, the lack of significant degradation mechanisms, and the results of the previous vessel examinations (including RO15), ENO believes that the inspections already performed at JAF, including the Phase II inspections planned for RO16, provides an acceptable level of quality and safety. Entergy considers the Phase I inspection (OD inspection) completed in RO15, and the Phase II inspection (ID inspection) planned for RO16, which will be completed to the maximum extent practical, to meet the underlying objective of relief request #18; in that maximum coverage of the axial welds will be completed with "new generation" tooling resulting in improved results than could be achieved with conventional tooling.

References:

1. NYPA Letter (JPN-99-026) to NRC, "Proposed Alternatives in Accordance with 10CFR50.55a(a)(3)(i) and Relief From ASME Section XI Code Regarding Inspection of RPV Vertical Shell and Shell to Flange Welds" (Relief Requests #18 and #19), August 5, 1999.
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3. Entergy Letter (JAFP-01-0262) to NRC, "Status Report on Tooling Development Alternatives in Accordance with 10CFR50.55a(a)(3)(i) and Relief from ASME Section XI Code Regarding Inspection of RPV Vertical Shell Welds" (Relief Request No. 18), December 20, 2001.
4. BWRVIP-05 (EPRI TR-105697), BWR RPV Shell Weld Inspection Recommendations, September 1995.

Attachment 2 to JAFP-03-0111

Relief Request #30

Relief Request Regarding Augmented Inspection of Reactor Pressure Vessel Vertical Shell Welds

TABLES 2.1 and 2.2

Table 2.1 EXAMINATION OF ALL REACTOR VESSEL AXIAL WELDS			
Weld Number ID	**Total Weld Length (in)**	**Projected ID (unless noted) Examination Total Length (in)**	**% Of Total Weld Length to be Examined (1)**
VV-1A	150	141	94%
VV-1B	150	141	94%
VV-1C	150	150	100%
VV-2A	150	114.5	76%
VV-2B	150	103.5	69%
VV-2C	150	114.5	76%
VV-3A	150	61.5	41%
VV-3B	150	129	86%
VV-3C	150	61.5	41%
VV-4A	150	109(3)	73%
VV-4B	150	109(3)	73%
VV-4C	150	109.5	73%
TOTAL	1800	1344	74.7 (2)

(1) Limitations due to physical obstructions were discussed in detail in reference (3).
(2) With conventional tooling projected total exam coverage was 50.8%.
(3) VV-4A and VV-4B coverage is from OD only

Table 2.2 PROJECTED EXAMINATION COVERAGE OF RPV BELTLINE REGION AXIAL WELDS			
Weld Number ID	**Weld Length in Beltline Region**	**Projected ID Examination (unless noted) Length in Beltline Region (in)**	**% Of Weld Length In Beltline to be Examined**
VV-3A	**112**	**23.5**	**21% (1)**
VV-3B	**112**	**112**	**100% (1)**
VV-3C	**112**	**23.5**	**21% (1)**
VV-4A	**56**	**51(2)**	**91% (2)**
VV-4B	**56**	**51(2)**	**91% (2)**
VV-4C	**56**	**56**	**100% (1)**
TOTAL	**504**	**317**	**62.9**

(1) Estimated coverage based on access evaluation by WESDYNE to be completed during RO16. (Fall 2004) (Phase II ID exams)
(2) Actual exam results completed during RO15. (Fall 2002) (Phase I OD exams)