

March 9, 2000

Mr. Randall K. Edington
Vice President - Operations
Entergy Operations, Inc.
River Bend Station
P. O. Box 220
St. Francisville, LA 70775

SUBJECT: RIVER BEND STATION, UNIT 1 - EVALUATION OF RELIEF REQUESTS FOR
THE SECOND TEN-YEAR INTERVAL PUMP AND VALVE INSERVICE TESTING
PROGRAM (TAC NO. MA4546)

Dear Mr. Edington:

By letter dated November 30, 1998, Entergy Operations, Inc. (EOI), submitted a compiled list of requests for relief for the River Bend Station, Unit 1, first ten-year inservice inspection interval. EOI requested relief from the volumetric examination of essentially 100 percent of the volume required by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, for Examination Categories B-J (Pressure-retaining welds in Class I components) and B-F (Reactor Pressure Vessel nozzle-to-safe end butt welds), and to defer surface examination for Examination Category C-G (Pump casing welds in Class 2 pumps). These relief requests are addressed in the submittal as RR1-0001, Revision 4; RR1-0003, Revision 3; RR1-0007, Revision 5; RR1-0008, Revision 3; RR1-0013, Revision 4; and RR1-0017, Revision 0. EOI stated that the code-required examination was deemed impractical due to the configuration of the component and/or interference from the adjacent component. The Nuclear Regulatory Commission staff has authorized the licensee's proposed alternative to the examination requirement and has granted relief pursuant to the provisions of 10 CFR 50.55a(g)(6)(i). The staff's evaluation is contained in the enclosed Safety Evaluation.

Sincerely,

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-458

Enclosure: Safety Evaluation

cc w/encl: See next page

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May 1999

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FIRST TEN-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

REQUESTS FOR RELIEF

ENTERGY OPERATIONS, INC.

RIVER BEND STATION

DOCKET NO. 50-458

1.0 INTRODUCTION

The inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code) Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Nuclear Regulatory Commission (NRC or the Commission) pursuant to 10 CFR 50.55a(g)(6)(i). Pursuant to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used when authorized by the NRC if (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.

In accordance with 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 ten-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 applicable ASME Code, Section XI, for the River Bend Stations, Unit 1 (RBS), first ten-year ISI interval is the 1980 Edition through the Winter 1981 Addenda. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed therein, and subject to Commission approval.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request

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made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed.

By letter dated November 30, 1998, Entergy Operations, Inc., the licensee for RBS, submitted to the NRC its requests for relief from the ASME Code-required volumetric and surface examination coverages of certain Class 1 and 2 components for the first ten-year inspection interval. For each of the welds, the component configuration and/or the interference of the adjacent component precluded the volumetric or the surface examination and, therefore, the ASME Code-required examination of the weld was deemed impractical. The NRC staff has reviewed and evaluated the licensee's requests for relief and the supporting information, pursuant to 10 CFR 50.55a(g)(6)(i).

2.0 DISCUSSION

2.1 Relief Request RR1-0001, Revision 4

2.1.1 System/Component for which Relief is Requested

Relief is requested for pressure-retaining component welds in the reactor core isolation cooling, the reactor water clean-up, and the main steam systems. ASME Code, Section XI, IWB-2500-1, Examination Category B-J, Item Numbers B9.11 and B9.31, apply to these welds.

2.1.2 Code Requirements

ASME Code, Section XI, 1980 Edition through the Winter 1981 Addenda, requires volumetric and surface examination of essentially 100 percent of the weld volume and of the surface.

2.1.3 Licensee's Basis for Relief

For 23 welds listed in this relief request, the component configuration causes most of the volume in each weld to be inaccessible for volumetric examination. The average volumetric coverage of welds selected for examination was approximately 40 percent, ranging from 25 percent to 73 percent.

2.1.4 Licensee's Proposed Alternative

Each weld selected for mandatory examination will be volumetrically examined to the maximum extent practical, and will be surface examined in accordance with the ASME Code.

2.2 Relief Request RR1-0003, Revision 3

2.2.1 System/Component for which Relief is Requested

Relief is requested for pump housing encasement welds in the high pressure core spray, low pressure core spray, and the residual heat removal pumps. ASME Code, Section XI, IWC-2500-1, Examination Category C-G, Item Number C6.10, applies to these welds.

2.2.2 Code Requirements

ASME Code, Section XI, 1980 Edition through the Winter 1981 Addenda, requires surface examination of the weld.

2.2.3 Licensee's Basis for Relief

Fifteen pump casing welds of each pump are inaccessible for surface examination due to close proximity of the adjacent structure, interference from flange bolting, and obstructions from pump heat exchangers.

2.2.4 Licensee's Proposed Alternative

The ASME Code-required examination will be deferred until disassembly of each pump for normal maintenance.

2.3 Relief Request RR1-0007, Revision 5

2.3.1 System/Component for which Relief is Requested

Relief is requested for pressure-retaining piping welds in the main steam and the reactor recirculation piping. ASME Code, Section XI, IWB-2500-1, Examination Category B-J, Item Numbers B9.11 and B9.12, apply to these welds.

2.3.2 Code Requirements

ASME Code, Section XI, 1980 Edition through the Winter 1981 Addenda, requires volumetric and surface examination of essentially 100 percent of the weld volume and of the surface.

2.3.3 Licensee's Basis for Relief

For 31 welds listed in this relief request, the interferences from integral attachments, branch connections, and code plates preclude 100 percent volumetric examination of the welds. The volumetric examination coverage averaged approximately 73 percent, ranging from 40 percent to 90 percent.

2.3.4 Licensee's Proposed Alternative

Each weld will be surface examined in accordance with the ASME Code.

2.4 Relief Request RR1-0008, Revision 3

2.4.1 System/Component for which Relief is Requested

Relief is requested for pressure-retaining component welds in the reactor recirculation piping. ASME Code, Section XI, IWB-2500-1, Examination Category B-J, Item Number B9.11, applies to these welds.

2.4.2 Code Requirements

ASME Code, Section XI, 1980 Edition through the Winter 1981 Addenda, requires volumetric and surface examination of essentially 100 percent of the weld volume and of the surface.

2.4.3 Licensee's Basis for Relief

For 61 welds listed in this relief request, the component configuration precludes 100 percent volumetric examination of the welds. The volumetric examination coverage averaged approximately 49 percent, with single-sided access using the "V and half" technique ranging from 40 percent to 50 percent.

2.4.4 Licensee's Proposed Alternative

Each weld will be surface examined in accordance with the ASME Code.

2.5 Relief Request RR1-0013, Revision 4

2.5.1 System/Component for which Relief is Requested

Relief is requested for pressure-retaining component welds in the reactor recirculation piping. ASME Code, Section XI, IWB-2500-1, Examination Category B-J, Item Numbers B9.11 and B9.12, apply to these welds.

2.5.2 Code Requirements

ASME Code, Section XI, 1980 Edition through the Winter 1981 Addenda, requires volumetric and surface examination of essentially 100 percent of the weld volume and of the surface.

2.5.3 Licensee's Basis for Relief

For ten welds selected for examination as stated in this relief request, the interference of radiation shielding plugs preclude ASME Code-required 100 percent volumetric and surface examination. The average volumetric coverage was approximately 29 percent, ranging from 25 percent to 30 percent.

2.5.4 Licensee's Proposed Alternative

Each weld will be volumetrically examined and surface examined for the accessible portion in accordance with the ASME Code.

2.6 Relief Request RR1-0017, Revision 0

2.6.1 System/Component for which Relief is Requested

Relief is requested for Reactor Pressure Vessel nozzle-to-safe end butt welds. ASME Code, Section XI, IWB-2500-1, Examination Category B-F, Item Number B5.10, applies to these welds.

2.6.2 Code Requirements

ASME Code, Section XI, 1980 Edition through the Winter 1981 Addenda, requires volumetric and surface examination of essentially 100 percent of the weld volume and of the surface.

2.6.3 Licensee's Basis for Relief

For 22 welds listed in this relief request, the nozzle configuration does not permit the ASME Code-required 100 percent volumetric examination. The profile of the vessel nozzle limits examination from the nozzle side of the weld. The volumetric examination coverage averages approximately 78 percent, ranging from 71 percent to 82 percent.

2.6.4 Licensee's Proposed Alternative

Each weld will be volumetrically examined to the maximum extent practical and will be surface examined in accordance with the ASME Code.

3.0 EVALUATION

3.1 Relief Request RR1-0001, Revision 4

Relief Request RR1-0001, Revision 4, pertains to limitations in volumetric examination of piping welds in the B-J Examination Category performed during the first ten-year ISI interval. The weld configuration corresponds to tee-to-flange, pipe-to-tee, or sweepolet-to-flange. Such configurations cause most of the volume of the weld to be inaccessible for ultrasonic examination. However, the licensee has performed a best-effort volumetric examination of each weld, along with a surface examination.

3.2 Relief Request RR1-0003, Revision 3

Relief Request RR1-0003, Revision 3, addresses limitations to surface examination in the C-G Examination Category of pump casing welds on the high pressure core spray, low pressure core spray, and residual heat removal pumps, due to obstructions from adjacent structures and components, and inaccessibility of certain welds due to flange bolting. These welds can be meaningfully surface-examined, from the inside, when the pumps are disassembled. Therefore, the licensee has proposed to defer the surface examination until the time when the pumps are disassembled for routine maintenance.

3.3 Relief Request RR1-0007, Revision 5

Relief Request RR1-0007, Revision 5, pertains to the limited volumetric examination of piping welds in the B-J Examination Category due to interference of integral attachments, branch connections, and ASME Code plates. The volumetric coverage averaged approximately 73 percent and each weld was surface examined in accordance with the ASME Code.

3.4 Relief Requests RR1-0008, Revision 3 and RR1-0017, Revision 0

Relief Requests RR1-0008, Revision 3, and RR1-0017, Revision 0, address limitations to volumetric examination in the B-J and B-F Examination Categories, respectively, due to component configuration such as pipe-to-sweepolet, pipe-to-valve, pipe-to-tee, and nozzle-to-safe end. The volumetric examination coverages have ranged from 50 percent to 82 percent. However, each weld was surface examined in accordance with the ASME Code.

3.5 Relief Request RR1-0013, Revision 4

Relief Request RR1-0013, Revision 4, pertains to limited volumetric and surface examination in the B-J Examination Category due to interference of radiation shielding plugs installed in the vicinity of the welds. The licensee has performed the ASME Code-required examination of the accessible portion of the weld.

3.6 Evaluation Summary

The staff has determined that the ASME Code requirements applicable to the welds addressed in the above reliefs are impractical due to inaccessibility to scan essentially 100 percent of weld volume either due to the component configuration or due to interference from the adjacent component. If the ASME Code requirements were to be imposed on the licensee, components would have to be redesigned and replaced, which would cause significant burden to the licensee. However, the examinations conducted by the licensee should have detected a pattern of service-related degradation if any were present in the welds. Therefore, the licensee's proposed alternative provides reasonable assurance of structural integrity of the welds in the relief requests.

4.0 CONCLUSION

The staff has reviewed the licensee's submittal and has concluded that the ASME Code examination requirements are impractical to comply with, due to inaccessibility and due to configuration of the weld. The staff has further determined that if the ASME Code requirements were to be imposed on the licensee, the components would have to be redesigned which would impose significant burden on the licensee. The staff believes that the examination coverages of the accessible weld volume provide reasonable assurance of the structural integrity of the subject welds. Therefore, the relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the RBS first ten-year ISI interval. The relief granted is authorized by law and will not endanger life, property, or the common defense and security, and is otherwise in the public interest, given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Principal Contributor: P. Patnaik

Date: March 9, 2000