



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUESTS FOR RELIEF

NOS. RR2-0001 THROUGH RR2-0003

ENTERGY OPERATIONS, INC.

RIVER BEND STATION, UNIT 1

DOCKET NUMBER: 50-458

1.0 INTRODUCTION

The Technical Specifications (TS) for River Bend Station, Unit 1 state that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall 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 written 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 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.

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 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) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the River Bend Station, Unit 1 second ten-year inservice inspection (ISI) interval is the 1992 Edition with portions of the 1993 Addenda. Authorization to use this Code Edition/Addenda of the Code was obtained in an NRC Safety Evaluation dated December 12, 1996.

By a letter dated January 7, 1998, Entergy Operations, Inc. (licensee) submitted its second ten-year interval inservice inspection plan associated Requests for Relief Nos. RR2-0001 through RR2-0003 for River Bend Station, Unit 1. Additional information was provided by the licensee in its letter dated July 8, 1998.

ENCLOSURE

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2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering and Environmental Laboratory (INEEL), has evaluated the information provided by the licensee in support of its Requests for Relief Numbers RR2-0001 through RR2-0003 for River Bend Station, Unit 1. Based on the results of the review, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report (TLR) attached.

Request for Relief No. RR2-0001: ASME Code, Section XI, Examination Category B-A, Item B1.22 requires that essentially 100% of the accessible length of all reactor pressure vessel (RPV) meridional welds be volumetrically examined as defined by Figure IWB-2500-3. In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required volumetric examination of RPV meridional head Welds B13-D001-DG and DH.

The Code requires 100% volumetric examination for the subject RPV meridional head welds. However, access to these welds is restricted by the control rod drive assemblies and the RPV support structure. As a result, the volumetric examinations are impractical. Design modifications would be required to provide access for the Code-required examinations. Imposition of this requirement would cause a considerable burden on the licensee.

Prior to CRD installation, the preservice examination of 100% of these welds found no recordable indications using manual ultrasonic techniques. Examination from below the RPV support structure would not provide meaningful results without removal of portions of the CRD. In addition, excessive radiation exposure to personnel would be incurred if the licensee attempted to examine these welds from the underside of the RPV head.

The licensee is examining the complete Code-required volume of other RPV welds. These examinations, in conjunction with the periodic system pressure tests, should detect any significant patterns of degradation and provide reasonable assurance of continued structural integrity. The staff concluded that the Code requirements are impractical and relief is granted, pursuant to 10 CFR 50.55a(g)(6)(i) for the current interval.

Request for Relief No. RR2-0002: ASME Code, Section XI, Examination Category C-B, Item C2.22 requires 100% volumetric examination of Class 2 pressure-retaining nozzle inside radius sections, each inspection interval, as defined by Figure IWC-2500-4(a) or (b). In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required volumetric examination of Nozzle Inner Radius Sections N3 (E12-EB001X-3.743-A) and N4 (E12-EB001X-3.744-A) for Residual Heat Removal (RHS) Heat Exchangers A, B, C, and D.

The Code requires 100% volumetric examination each inspection interval of nozzle inner radius sections that are either welded to or integrally cast in vessels that connect to piping runs. However, a review of the nozzles' geometric configurations indicates that the substantial wall thicknesses and small diameters of the nozzles limit meaningful volumetric examination. While surface examination of the subject inside radius sections is possible, this would require the tube bundle to be removed for access to these areas. Therefore, the Code-required volumetric examination is impractical at River Bend, Unit 1. To perform the examination, the RHS nozzles

would have to be redesigned and modified. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee has proposed to perform a surface examination of the subject nozzle inner radius sections if the tube bundles are removed for maintenance.

The staff concluded that removal and replacement of a tube bundle from the RHR heat exchangers is a major modification and is not a common maintenance task. The staff also concluded that the likelihood of the licensee to perform its proposed alternative surface examinations on the inner radius surface of the four subject RHR heat exchangers are low. However, the Code in addition to the required volumetric examinations or the licensee's proposed alternative requires VT-2 visual inspections during system leakage and system hydrostatic testing. The staff concluded that the combination of the licensee's proposed alternative when performed and/or when the Code required VT-2 visual inspections, are performed provides reasonable assurance of structural integrity of the subject components. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted for the current interval.

Request for Relief No. RR2-0003: ASME Code, Section XI, Examination Category C-G, Item C6.10 requires 100% surface examination of welds in all components in each piping run to be examined under Examination Category C-F in accordance with the examination requirements of Figure IWC-2500-8.

In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required surface examination of the pressure-retaining welds on the following Class 2 pumps:

<u>Residual Heat Removal (RHS)</u>		
E12-PC002A	E12-PC002B	E12-PC002C
<u>High Pressure Core Spray (CSH)</u>		
E22-PC001		
<u>Low Pressure Spray (CSL)</u>		
E21-PC001		

The Code requires that Class 2 pump casing welds receive a 100% surface examination from either the inside or outside surface of the component. The pump casing welds of this relief request are encased in concrete, precluding examination from the outside surface. Therefore, the Code-required surface examination is impractical to perform to the extent required by the Code. To achieve the Code-required examination coverage, the pumps and their surrounding support structure would have to be disassembled and the component would have to be redesigned. Imposition of this requirement for the sole purpose of inspecting the welds would cause a considerable burden on the licensee.

The licensee has proposed to perform the required examinations when a pump is disassembled for maintenance. The staff has concluded that the licensee's proposed alternative provides reasonable assurance of the continued structural integrity of the pump casing and that the licensee's relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the current interval.

3.0 CONCLUSION

The staff has concluded that for Requests for Relief Nos. RR2-0001, RR2-0002, and RR2-0003 the licensee has provided information to support the determination that the Code requirements are impractical and that the licensee's proposed alternative provides reasonable assurance of the continued structural integrity of the pump casing. For Requests for Relief Nos. RR2-0001, RR2-0002, and RR2-0003, the staff concluded that relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the current interval.

The Commission may grant such relief and may impose alternative requirements as it determines is authorized by law giving due consideration to the burden upon the licensee if the requirements were imposed on the facility.

Attachment: As stated

Principal Coordinator: T. McLellan, DE/ECGB

Date: November 3, 1998

TECHNICAL LETTER REPORT
ON THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION
REQUESTS FOR RELIEF NOS. RR2-0001 THROUGH RR2-0003
FOR
ENTERGY OPERATIONS, INC.
RIVER BEND STATION, UNIT 1
DOCKET NUMBER: 50-458

1. INTRODUCTION

By letter dated January 7, 1998, the licensee, Entergy Operations, Inc., submitted Requests for Relief No. RR2-0001 through RR2-0003, seeking relief from second 10-year inservice inspection (ISI) interval requirements of the ASME Code, Section XI, for the River Bend Station, Unit 1. By letter dated July 8, 1998, the licensee responded to an NRC request for additional information regarding Request for Relief RR2-003. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject requests for relief is in the following section.

2. EVALUATION

The information provided by Entergy Operations, Inc. in support of the requests for relief from Code requirements has been evaluated and the bases for disposition are documented below. The Code of record for the River Bend Station, Unit 1, second 10-year ISI interval, which began December 1, 1997, is the 1992 Edition, with portions of the 1993 Addenda, of Section XI of the ASME Boiler and Pressure Vessel Code. Authorization to use this Edition/Addenda of the Code was obtained in an NRC Safety Evaluation Report dated December 12, 1996.

A. Request for Relief No. RR2-0001, Examination Category B-A, Item B1.22, Reactor Pressure Vessel Meridional Head Welds

Code Requirement—Examination Category B-A, Item B1.22 requires that essentially 100% of the accessible length of all reactor pressure vessel (RPV) meridional welds be volumetrically examined as defined by Figure IWB-2500-3.

ATTACHMENT

Licensee's Request for Relief—In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required volumetric examination of RPV meridional head Welds B13-D001-DG and DH.

Licensee's Basis for Requesting Relief—

"Inservice volumetric (ultrasonic) examination coverage of meridional welds 13-D001-DG and DH cannot be performed due to installed control rod drive (CRD) assemblies penetrating through the bottom vessel head.

"Preservice inspection was performed by manual ultrasonic examination with full weld coverage and no recordable indications. This inspection was performed prior to CRD installation.

"The installed CRD housings physically prohibit a meaningful volumetric examination to be performed on the DG and DH vessel welds.

"Inspection of the weld(s) from beneath the bottom head will require removal of portions of the control rod drive (CRD). Performing the required examinations is impractical and would result in undue hardship, i.e., increased ALARA considerations and extended outage duration, without a compensating increase in safety."

Licensee's Proposed Alternative Examination (as stated)—

"None. This area is VT-2 examined during each refueling outage."

Evaluation—The Code requires 100% volumetric examination for the subject RPV meridional head welds. However, access to these welds is restricted by the control rod drive assemblies and the RPV support structure. As a result, the volumetric examinations are impractical. Design modifications would be required to provide access for the Code-required examinations. Imposition of this requirement would cause a considerable burden on the licensee.

Prior to CRD installation, the preservice examination of 100% of these welds found no recordable indications using manual ultrasonic techniques. Examination from below the RPV support structure would not provide meaningful results without removal of portions of the CRD. In addition, excessive radiation exposure to personnel would be incurred if the licensee attempted to examine these welds from the underside of the RPV head.

The licensee is examining the complete Code-required volume of other RPV welds. These examinations, in conjunction with the periodic system pressure tests, should detect any significant patterns of degradation and provide reasonable assurance of continued structural integrity. Therefore, based on the impracticality of the Code-required volumetric examination, it is recommended that relief be granted, pursuant to 10 CFR 50.55a(g)(6)(i).

B. Request for Relief No. RR2-0002, Examination Category C-B, Item C2.22, Residual Heat Removal Heat Exchanger Nozzle Inside Radius Sections

Code Requirement—Examination Category C-B, Item C2.22 requires 100% volumetric examination of Class 2 pressure-retaining nozzle inside radius sections, each inspection interval, as defined by Figure IWC-2500-4(a) or (b).

Licensee's Request for Relief—In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required volumetric examination of Nozzle Inner Radius Sections N3 (E12-EB001X-3.743-A) and N4 (E12-EB001X-3.744-A) for Residual Heat Removal (RHS) Heat Exchangers A, B, C, and D.

Licensee's Basis for Requesting Relief (as stated)—

"The heat exchanger nozzles contain inherent geometric constraints which limit the ability to perform the code required volumetric examinations. Due to the thickness and nozzle size, examinations cannot be performed.

"Based on the configuration of the nozzle and heat exchanger, the inner radius areas cannot receive a code required examination. Refer to Figures 1 and 2 for detailed component configuration."

Licensee's Proposed Alternative Examination (as stated)—

"If tube bundles are removed from the heat exchangers for maintenance, then surface examinations will be performed as an alternative examination on the subject inner radius areas."

Figures provided by the licensee are not included in this report.

Evaluation—The Code requires 100% volumetric examination each inspection interval of nozzle inner radius sections that are either welded to or integrally cast in vessels that connect to piping runs. However, a review of the nozzles' geometric configurations indicates that the substantial wall thicknesses and small diameters of the nozzles limit meaningful volumetric examination. While surface examination of the subject inside radius sections is possible, this would require the tube bundle to be removed for access to these areas. Therefore, the Code-required volumetric examination is impractical at River Bend, Unit 1. To perform the examination, the RHS nozzles would have to be redesigned and modified. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee has proposed to perform a surface examination of the subject nozzle inner radius sections if the tube bundles are removed for maintenance. The staff believes that removal and replacement of a tube bundle from the RHR heat exchangers is a major modification and is not a common maintenance task. Therefore, the likelihood of surface examinations being performed on the inner radius surface of the four subject RHR heat exchangers appears to be low.

However, the vessels receive the Code-required VT-2 visual inspections during system leakage and system hydrostatic testing. During VT-2 visual inspections, if leakage of these vessels is observed, appropriate actions can be taken to maintain reasonable assurance of continued operational readiness. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted.

C. Request for Relief No. RR2-0003, Examination Category C-G, Item C6.10, Pump Casing Welds

Code Requirement—Examination Category C-G, Item C6.10 requires 100% surface examination of welds in all components in each piping run to be examined under Examination Category C-F in accordance with the examination requirements of Figure IWC-2500-8.

Licensee's Request for Relief—In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required surface examination of the pressure-retaining welds on the following Class 2 pumps:

Residual Heat Removal (RHS)

E12-PC002A

E12-PC002B

E12-PC002C

High Pressure Core Spray (CSH)

E22-PC001

Low Pressure Spray (CSL)

E21-PC001

Licensee's Basis for Requesting Relief (as stated)—

"Due to the pump barrel welds being encased in the concrete, under the floor, these welds are inaccessible to required examinations. See Figure 1 for typical pump configuration.¹

"Welds encased in concrete cannot be accessed from exterior and the only access to the pump interior is during pump disassembly."

Licensee's Proposed Alternative Examination (as stated)—

"If the subject pumps are disassembled for maintenance, then the required examinations will be performed."

Evaluation—The Code requires that Class 2 pump casing welds receive a 100% surface examination from either the inside or outside surface of the component. The pump casing welds of this relief request are encased in concrete, precluding examination from the outside surface. Therefore, the Code-required surface examination is impractical to perform to the extent required by the Code. To achieve the Code-required examination coverage, the pumps and their surrounding support structure would have to be disassembled. Imposition of this requirement for the sole purpose of inspecting the welds would cause a considerable burden on the licensee.

The licensee has proposed to perform the required examinations when a pump is disassembled for maintenance. This will detect significant degradation and provide reasonable assurance of the continued structural integrity of the pump casing. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

Figures provided by the licensee are not included in this report.

3. CONCLUSION

The INEEL staff evaluated the licensee's submittal and concluded that certain inservice examinations cannot be performed to the extent required by the Code at the River Bend Station, Unit 1. For Requests for Relief Nos. RR2-0001, RR2-0002, and RR3-0003 the licensee has provided information to support the determination that the Code requirements are impractical; therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).