Entergy

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Michael A. Krupa
Director
Nuclear Safety & Licensing

CNRO-2003-00062

December 4, 2003

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Entergy Operations, Inc.
Requests for Relief from ASME Section XI Volumetric Examination Requirements

River Bend Station
Docket No. 50-458
License No. NPF-47

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(g)(6)(i), Entergy Operations, Inc. (Entergy) requests relief from the requirements of ASME Section XI pertaining to volumetric examination of pressure-retaining welds for River Bend Station. In several locations, the required coverage cannot be obtained due to interference or geometry. Relief Requests RBS-ISI-001, -002 and -003 are provided in Enclosures 1, 2, and 3, respectively.

Entergy requests that the NRC staff grant the enclosed relief requests on or before December 4, 2004.

This letter contains no commitments.

Should you have any questions regarding these requests, please contact Guy Davant at (601) 368-5756.

Very truly yours,

M. A. Krupa

MAK/GHD/bal

Enclosures:
1. Relief Request RBS-ISI-001
2. Relief Request RBS-ISI-002
3. Relief Request RBS-ISI-003

cc: (see next page)

A047

cc: Mr. W. A. Eaton (ECH)
Mr. P. D. Hinnenkamp (RBS)

Mr. P. J. Alter, NRC Senior Resident Inspector (RBS)
Mr. B. S. Mallett, NRC Region IV Regional Administrator
Mr. M. K. Webb, NRR Project Manager (RBS)

ENCLOSURE 1

CNRO-2003-00062

RELIEF REQUEST
RBS-ISI-001

ENTERGY OPERATIONS, INC.
RELIEF REQUEST
RBS-ISI-001

I. COMPONENTS

Components/Numbers:	Class 1 B-J welds listed in Table 1, below.
ASME Code Class:	1
References:	1. ASME Section XI 1992 Edition, Table IWB-2500-1 2. ASME Section XI 1980 Edition with the Winter of 1981 Addenda for ultrasonic examinations 3. ASME Section XI, Appendix VIII, Supplements 2 and 3 of the 1995 Edition with 1996 Addenda 4. ASME Code Case N-460 – Alternative Examination Coverage for Class 1 and 2 Welds, Section XI, Division 1 5. Letter from the NRC to Entergy Operations, Inc., *Evaluation of Entergy Operations, Inc. Request for Authorization to Update Inservice Inspection Programs to the 1992 and Portions of the 1993 ASME Boiler and Pressure Vessel Code, Section XI for Arkansas Nuclear One, Units 1 and 2, Grand Gulf Nuclear Station, River Bend Station, and Waterford Steam Electric Station, Unit 3 (TAC Nos. M94472, M94471, M94454, M94473, and M94488)*, dated December 12, 1996
Examination Category:	B-J
Item Numbers:	B9.11, B9.31
Description:	Pressure-retaining welds in piping
Unit / Inspection Interval Applicability:	River Bend Station – Second (2^{nd}) 10-year interval

II. CODE REQUIREMENT(S)

ASME Section XI, Table IWB-2500-1, Examination Category B-J, Items B9.11 and B9.31 require essentially 100% volumetric examination of pressure-retaining welds. However, ASME Code Case N-460 allows a reduction in coverage for Class 1 and 2 welds due to interference or geometry as long as the overall coverage is greater than 90%.

III. RELIEF REQUESTED

Pursuant to 10 CFR 50.55a(g)(6)(i), Entergy Operations, Inc. (Entergy) requests relief from achieving the Code-required coverage (> 90%) when performing volumetric examinations of the components identified in Table 1, below.

Table 1 Limited B-J Examinations				
Item #	Item ID	Description	Coverage (%)	Reason for Limitation
B9.11	1RCS-900B-FWB06	Nozzle-to-Pipe	60.5	Weld configuration and weld build-up on the ID and OD
B9.11	1RCS-900C-FWB15	Pipe-to-Cross	70	Sweep-O-Let to Pipe configuration
B9.11	1RCS-900C-FWB16	Pipe-to-Cross	70	Sweep-O-Let to Pipe configuration
B9.11	1RCS-900CX-SW014BC	Pipe-to-Cross	71.5	Sweep-O-Let to Pipe configuration
B9.31	1RCS-900CX-SW014CB	Sweep-O-Let to Pipe	71.5	Sweep-O-Let to Pipe configuration
B9.31	1WCS-001A1-XI-FW005	Sweep-O-Let tc Pipe	40	Pipe-to-Valve configuration
B9.31	1WCS-001A3-XI-FW011	Sweep-O-Let to Pipe	58	Pipe-to-Reducer configuration

IV. Basis for Relief

The identified ASME Class 1 piping and components were designed with welded joint configurations, such as sweep-o-let-to-pipe, pipe-to-valve, and pipe-to-reducer, which physically obstruct part of the required examination area. The subject welds were examined to the maximum extent practical; however, greater than 90% of the required examination volume as allowed by ASME Code Case N-460 could not be achieved. The ultrasonic examination coverage calculation sheets are provided in the attachment to this relief request. Although these welds were examined prior to May 22, 2000 (mandatory implementation of Appendix VIII), the examination procedures, personnel, and equipment were certified through the Performance Demonstrative Initiative (PDI).

During the PDI qualification process for examination of austenitic welds, single-side examination with a shear wave was proven unsatisfactory on the far side of the weld due to attenuation and distortion of the sound wave. The refracted longitudinal wave demonstrated better penetration on the far side with evidence of crack detection; however, it was not fully qualified. Entergy performs a "best effort" examination by extending a shear wave and/or a refracted longitudinal wave into the far side of the weld, looking for evidence of cracking.

Entergy has used the best available techniques demonstrated through the PDI process. Weld selection has been optimized to minimize the number of welds requiring relief. To perform the Code-required examination, modification and/or replacement of the component would be required. Consistent with the ASME Section XI sampling approach,

examination of the subject welds as described within, combined with examinations of other welds within the same examination category, is adequate to identify any generic degradation that may exist.

V. PROPOSED ALTERNATIVE EXAMINATIONS

As stated above, Entergy has examined these welds to the extent practical using PDI-qualified procedures, personnel, and equipment. Entergy will continue to perform pressure testing on these welds as required by ASME Section XI.

VI. CONCLUSION

10 CFR 50.55a(g)(6)(i) states:

> The Commission will evaluate determinations under paragraph (g)(5) of this section that code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Due to design configuration, it is impractical to obtain greater than 90% coverage on these welds, as discussed in Section IV, above. To obtain the required coverage would necessitate modifying and/or replacing components. The examinations performed on the subject welds, in addition to the examination of similar welds contained in the program, would detect generic degradation if it existed, thereby demonstrating an acceptable level of integrity. Therefore, Entergy requests the NRC staff authorize the proposed alternative pursuant to 10 CFR 50.55a(g)(6)(i).

ATTACHMENT

RELIEF REQUEST
RBS-ISI-001

EXAMINATION COVERAGE CALCULATION SHEETS

Entergy

EXAMINATION COVERAGE CALCULATION SHEET

Attachment #: A

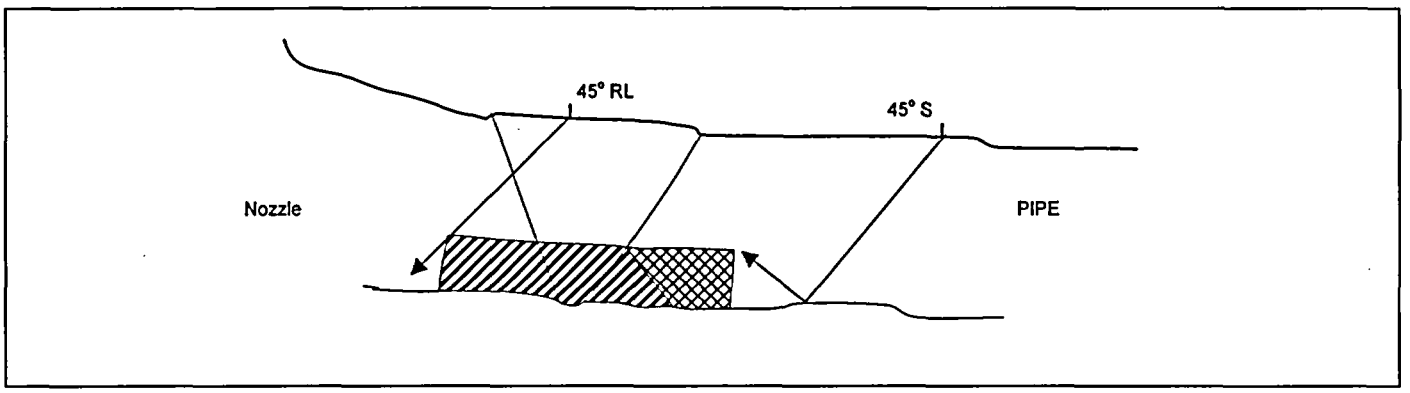
☐ ANO 1	☐ ANO 2	☐ Grand Gulf	■ River Bend	☐ Waterford 3

Component ID: 1RCS – 900B – FWB06 Report No.: 00IR20319 Material Type: SS

Pipe Diameter.: 20" Sch/ T: 1.3" Angle's Used: 45° S - ½ V, 45° RL – ½ V, 60° RL

NOTES:

1 **This is an approximate percent of the examination volume for which coverage was obtained.**
2 **The plot shown is a representation of the actual profile and not to scale.**



☐ No Coverage ▨ Direction #1 ▨ Direction #2

TOTAL EXAM VOLUME OBTAINED: 60.5 %

COMMENTS: Single side exam due to configuration (pipe to Nozzle). Scanned from pipe side only. Used 45° RL to scan with due to ID & OD overlay. Also used 45° shear per the procedure and 60° RL for best effort, all angles calibrated for ½ V path. The 45° RL and Shear were used for coverage calculation to obtain the most coverage. Exam performed on 3/12/00.

Entergy

EXAMINATION COVERAGE CALCULATION SHEET

Attachment #: B

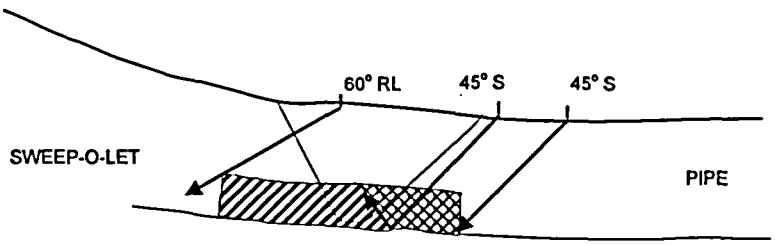
☐ ANO 1	☐ ANO 2	☐ Grand Gulf	■ River Bend	☐ Waterford 3

Component ID: 1RCS – 900C – FWB15 & FWB16 Report No.: 00IR20253 Material Type: SS

Pipe Diameter.: 10" Sch/ T: 0.63" Angle's Used: 45° S - ½ V, 60° L – ½ V

NOTES:

1. **This is an approximate percent of the examination volume for which coverage was obtained.**
2. **The plot shown is a representation of the actual profile and not to scale.**



☐ No Coverage ▨ Direction #1 ▨ Direction #2

TOTAL EXAM VOLUME OBTAINED: 70 %

COMMENTS: Single side exam due to configuration (pipe to sweep-o-let). Scanned from pipe side only. This plot represents the profile for both 1RCS – 900C-FWB15 and 1RCS – 900C-FWB16. 45° S and 60° RL were calibrated for ½ V path and used for coverage per the procedure. Exam performed on 3/9/00

Entergy

EXAMINATION COVERAGE CALCULATION SHEET

Attachment #: C

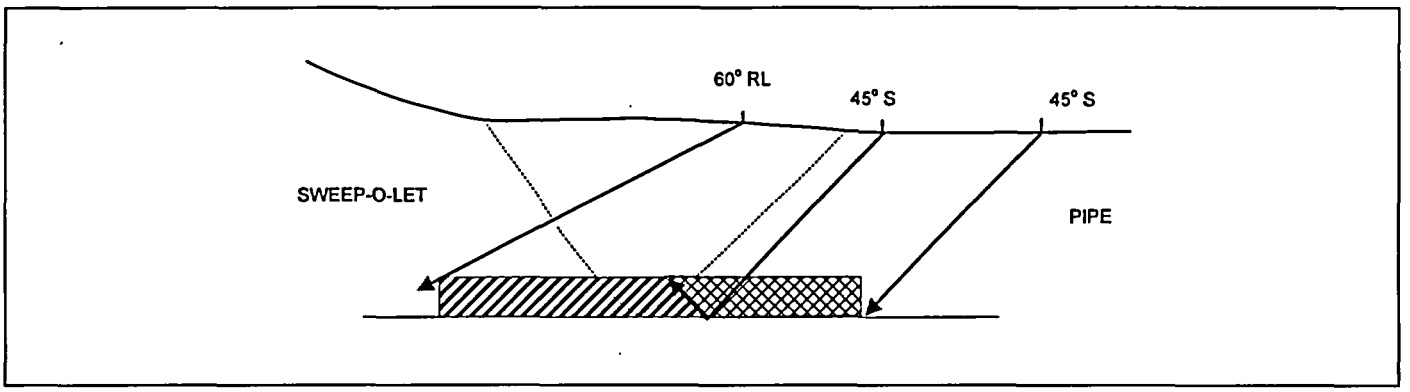
☐ ANO 1	☐ ANO 2	☐ Grand Gulf	■ River Bend	☐ Waterford 3

Component ID: 1RCS – 900CX – SW014 CB & SW014 BC Report No.: 00IR20252 Material Type: SS

Pipe Diameter.: 16" Sch/ T: 1.0" Angle's Used: 45° S - ½ V, 60° RL – ½ V

NOTES:

1. **This is an approximate percent of the examination volume for which coverage was obtained.**
2. **The plot shown is a representation of the actual profile and not to scale.**



No Coverage Direction #1 Direction #2

TOTAL EXAM VOLUME OBTAINED: 71.5 %

COMMENTS: Single side exam due to configuration (pipe to sweep-o-let). Scanned from pipe side only. This plot represents the profile for both 1RCS – 900CX-SW014-CB and 1RCS – 900CX-SW014-BC. 45° S and 60° RL were calibrated for ½ V path and used for coverage per the procedure. Exam performed on 3/9/00

Entergy

EXAMINATION COVERAGE CALCULATION SHEET

Attachment #: D

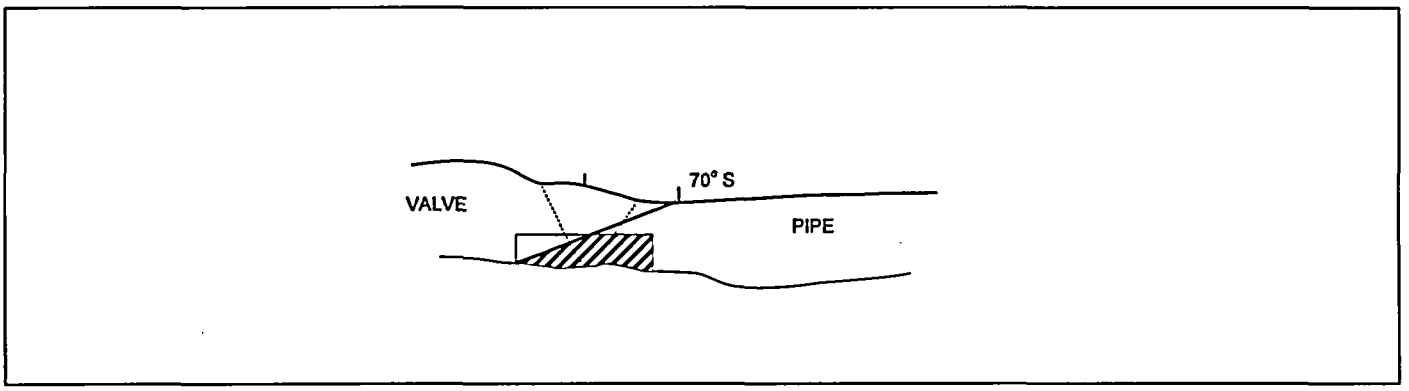
☐ ANO 1	☐ ANO 2	☐ Grand Gulf	■ River Bend	☐ Waterford 3

Component ID: 1WCS – 001A1 - XI – FW005 Report No.: 00IR20283 Material Type: SS

Pipe Diameter.: 4" Sch/ T: 0.53" Angle's Used: 70° S - ½ V

NOTES:

1. **This is an approximate percent of the examination volume for which coverage was obtained.**
2. **The plot shown is a representation of the actual profile and not to scale.**



No Coverage Direction #1 Direction #2

TOTAL EXAM VOLUME OBTAINED: 40 %

COMMENTS: Single side exam due to configuration (pipe to valve). Scanned from pipe side only. This plot represents the profile for 1WCS – 001A1-XI-FW005. 70° S was calibrated for ½ V path and used to obtain max coverage per the procedure. Exam performed on 3/14/00.

Entergy

EXAMINATION COVERAGE CALCULATION SHEET

Attachment #: E

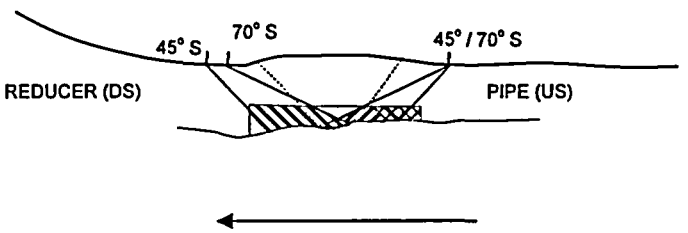
☐ ANO 1	☐ ANO 2	☐ Grand Gulf	■ River Bend	☐ Waterford 3

Component ID: 1WCS – 001A3 – XI - FW011 Report No.: 00IR20281 Material Type: SS

Pipe Diameter.: 4" Sch/ T: 337" Angle's Used: 45° S - ½ V, 70° S – ½ V

NOTES:

1. This is an approximate percent of the examination volume for which coverage was obtained.
2. The plot shown is a representation of the actual profile and not to scale.



☐ No Coverage ▨ Direction #1 ▨ Direction #2

TOTAL EXAM VOLUME OBTAINED: 58 %

COMMENTS: Axial exam from DS side limited to scan path of 0.25" x 360°, credit taken for first leg on DS side only due to irregular ID. This plot represents the profile for 1WCS – 001A3-XI-FW011. 45° S and 70° S were calibrated for ½ V path and used for coverage per the procedure. Exam performed on 3/11/00.

ENCLOSURE 2

CNRO-2003-00062

RELIEF REQUEST
RBS-ISI-002

ENTERGY OPERATIONS, INC.
REQUEST FOR RELIEF
RBS-ISI-002

I. COMPONENTS

Component/Number:	RHR heat exchanger vessel shell-to-flange weld E12-EB001A-3.706 (pressure-retaining weld)
ASME Code Class:	2
References:	1. ASME Section XI 1992 Edition, Table IWC-2500-1 2. ASME Section XI 1980 Edition with the Winter of 1981 Addenda for ultrasonic examinations 3. ASME Code Case N-460 – Alternative Examination Coverage for Class 1 and 2 Welds, Section XI, Division 1 4. Letter from the NRC to Entergy Operations, Inc., *Evaluation of Entergy Operations, Inc. Request for Authorization to Update Inservice Inspection Programs to the 1992 and Portions of the 1993 ASME Boiler and Pressure Vessel Code, Section XI for Arkansas Nuclear One, Units 1 and 2, Grand Gulf Nuclear Station, River Bend Station, and Waterford Steam Electric Station, Unit 3 (TAC Nos. M94472, M94471, M94454, M94473, and M94488)*, dated December 12, 1996
Examination Category:	C-A
Item Numbers:	C1.10
Unit / Inspection Interval Applicability:	River Bend Station – Second (2^{nd}) 10-year interval

II. CODE REQUIREMENT(S)

ASME Section XI, Table IWC-2500-1, Examination Category C-A, Item C1.10 requires essentially 100% volumetric examination of the pressure retaining welds. However, ASME Code Case N-460 allows a reduction in coverage for Class 1 and 2 welds due to interference or geometry as long as the overall coverage is greater than 90%.

III. RELIEF REQUESTED

Pursuant to 10 CFR 50.55a(g)(6)(i), Entergy Operations, Inc. (Entergy) requests relief from achieving the Code-required coverage (> 90%) when performing volumetric examinations of weld E12-EB001A-3.706. See Table 1, below.

Table 1 Limited C-A Examinations				
Item #	**Item ID**	**Item Description**	**Coverage (%)**	**Reason for Limitation**
C1.10	E12-EB001A-3.706	Shell circumferential weld – Shell to flange weld	61	Not examined from flange side due to configuration and nozzle interference

IV. BASIS FOR RELIEF

Entergy has examined weld E12-EB001A-3.706 to the maximum extent possible utilizing examination techniques and equipment qualified in accordance with the requirements of ASME Section XI. However, Entergy can obtain only 61% coverage of the weld due to configuration rather than the 90% allowed by ASME Code Case N-460. Specifically, examination from the flange side of the weld is not possible due to component configuration. Additionally, approximately ten (10) inches of the weld circumference cannot be scanned from either side of the weld due to the close proximity of the nozzle weld. The ultrasonic examination coverage calculation sheet is provided in the attachment to this relief request.

V. PROPOSED ALTERNATIVE EXAMINATIONS

As stated above, Entergy has examined weld E12-EB001A-3.706 to the maximum extent practical using qualified procedures, personnel and equipment. Entergy will continue to perform pressure testing on E12-EB001A-3.706 as required by ASME Section XI.

VI. CONCLUSION

10 CFR 50.55a(g)(6)(i) states:

> The Commission will evaluate determinations under paragraph (g)(5) of this section that code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Due to design configuration, it is impractical to obtain greater than 90% coverage on weld E12-EB001A-3.706. To obtain the required coverage would necessitate modification and/or replacement of the component. The examinations performed on this weld, in addition to the examination of similar welds contained in the program, would detect generic degradation, if it existed, thereby demonstrating an acceptable level of integrity. Therefore, Entergy requests the NRC staff authorize the proposed alternative pursuant to 10 CFR 50.55a(g)(6)(i).

ATTACHMENT

RELIEF REQUEST
RBS-ISI-002

EXAMINATION COVERAGE CALCULATION SHEET

Entergy

EXAMINATION COVERAGE CALCULATION SHEET

Attachment #: F

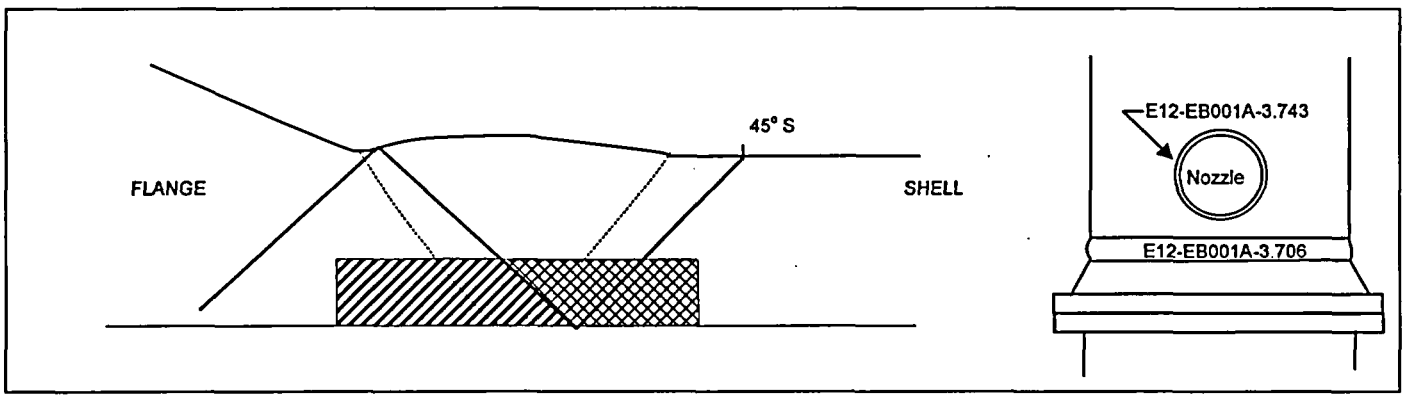
☐ ANO 1	☐ ANO 2	☐ Grand Gulf	■ River Bend	☐ Waterford 3

Component ID: E12-EB001A-3.706 Report No.: 99IR20301 Material Type: CS

Pipe Diameter.: 53" Sch/ T: .875" Angle's Used: 45° S - 1½ V

NOTES:

1. **The .25" dimension on each side of the weld is for non-risk informed ISI, for risk informed ISI the exam volume will be determined by the risk informed program.**
2. **This is an approximate percent of the examination volume for which coverage was obtained.**
3. **The plot shown is a representation of the actual profile and not to scale..**



No Coverage Direction #1 Direction #2

TOTAL EXAM VOLUME OBTAINED: 61 %

COMMENTS: No exam from flange side due to configuration. 45° S calibrated for 1½ V path and used for coverage per the procedure. Approximately 10" of this weld was not scanned from either side due to the close proximity of nozzle weld EB12-EB001A-3.743. This plot represents the profile for E12-EB001A-3.706. Exam performed on 4/10/99.

ENCLOSURE 3

CNRO-2003-00062

RELIEF REQUEST
RBS-ISI-003

ENTERGY OPERATIONS, INC.
REQUEST FOR RELIEF
RBS-ISI-003

I. COMPONENTS

Component/Number:	RHR heat exchanger vessel shell-to-nozzle weld E12-EB001A-3.743 (pressure-retaining weld)
ASME Code Class:	1
References:	1. ASME Section XI 1992 Edition, Table IWC-2500-1 2. ASME Section XI 1980 Edition with the Winter of 1981 Addenda for ultrasonic examinations 3. ASME Code Case N-460 – Alternative Examination Coverage for Class 1 and 2 Welds, Section XI, Division 1 4. Letter from the NRC to Entergy Operations, Inc., *Evaluation of Entergy Operations, Inc. Request for Authorization to Update Inservice Inspection Programs to the 1992 and Portions of the 1993 ASME Boiler and Pressure Vessel Code, Section XI for Arkansas Nuclear One, Units 1 and 2, Grand Gulf Nuclear Station, River Bend Station, and Waterford Steam Electric Station, Unit 3 (TAC Nos. M94472, M94471, M94454, M94473, and M94488)*, dated December 12, 1996
Examination Category:	C-B
Item Numbers:	C2.21
Unit / Inspection Interval Applicability:	River Bend Station – Second (2^{nd}) 10-year interval

II. CODE REQUIREMENT(S)

ASME Section XI, Table IWC-2500-1, Examination Category C-B, Item C2.21 requires essentially 100% volumetric examination of the pressure retaining welds. However, ASME Code Case N-460 allows a reduction in coverage for Class 1 and 2 welds due to interference or geometry as long as the overall coverage is greater than 90%.

III. RELIEF REQUESTED

Pursuant to 10 CFR 50.55a(g)(6)(i), Entergy Operations, Inc. (Entergy) requests relief from achieving Code-required coverage (> 90%) when performing volumetric examinations of weld E12-EB001A-3.743. See Table 1, below.

Table 1 Limited C-A Examinations				
Item #	**Item ID**	**Item Description**	**Coverage (%)**	**Reason for Limitation**
C2.21	E12-EB001A-3.743	Nozzle to Shell (or head) weld	73	Not examined due to configuration and adjacent weld interference.

IV. BASIS FOR RELIEF

Entergy has examined weld E12-EB001A-3.743 to the maximum extent possible utilizing examination techniques and equipment qualified in accordance with the requirements of ASME Section XI. However, Entergy can obtain only 73% coverage of the weld due to component configuration rather than the 90% allowed by ASME Code Case N-460. Specifically, examination from the nozzle side of the weld is not possible. Additionally, approximately six (6) inches of the weld circumference cannot be scanned from either side of the weld due to the close proximity to an adjacent weld. The ultrasonic examination coverage calculation sheet is provided in the attachment to this relief request.

V. PROPOSED ALTERNATIVE EXAMINATIONS

As stated above, Entergy has examined weld E12-EB001A-3.743 to the maximum extent practical using qualified procedures, personnel and equipment. Entergy will continue to perform pressure testing on E12-EB001A-3.743 as required by ASME Section XI.

VI. CONCLUSION

10 CFR 50.55a(g)(6)(i) states:

> The Commission will evaluate determinations under paragraph (g)(5) of this section that code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Due to design configuration, it is impractical to obtain greater than 90% coverage on weld E12-EB001A-3.743. To obtain the required coverage would necessitate modification and/or replacement of the component. The examinations performed on this weld, in addition to the examination of similar welds contained in the program, would detect generic degradation, if it existed, thereby demonstrating an acceptable level of integrity. Therefore, Entergy requests the NRC staff authorize the proposed alternative pursuant to 10 CFR 50.55a(g)(6)(i).

ATTACHMENT

RELIEF REQUEST
RBS-ISI-003

EXAMINATION COVERAGE CALCULATION SHEET

Entergy

EXAMINATION COVERAGE CALCULATION SHEET

Attachment #: G

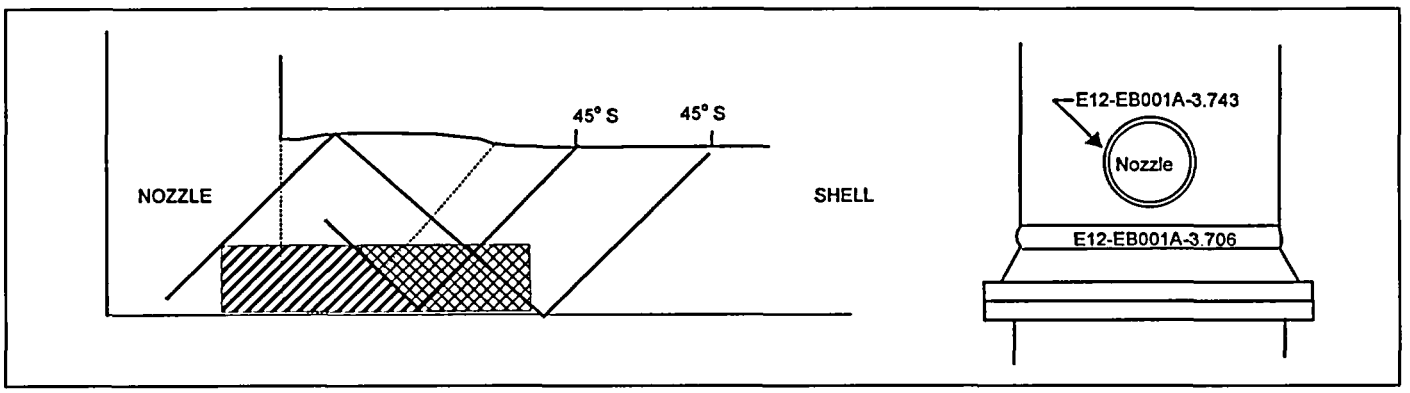
☐ ANO 1	☐ ANO 2	☐ Grand Gulf	■ River Bend	☐ Waterford 3

Component ID: E12-EB001A-3.743 Report No.: 99IR20300 Material Type: CS

Pipe Diameter.: 18" Sch/ T: .875" Angle's Used: 45° S - 1½ V

NOTES:

1. **The .25" dimension on each side of the weld is for non-risk informed ISI, for risk informed ISI the exam volume will be determined by the risk informed program.**
2. **This is an approximate percent of the examination volume for which coverage was obtained.**
3. **The plot shown is a representation of the actual profile and not to scale.**



No Coverage Direction #1 Direction #2

TOTAL EXAM VOLUME OBTAINED: 73 %

COMMENTS: No exam from Nozzle side due to configuration. 45° S calibrated for 1½ V path and used for coverage per the procedure. Approximately 6" of this weld was not scanned from either side due to the close proximity of nozzle to weld E12-EB001A-3.706. This plot represents the profile for E12-EB001A -3.743. exam performed on 4/10/99.