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10 CFR 50.55a

CNRO2020-00032

December 30, 2020

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

Subject: Relief Request Number EN-20-RR-003, Proposed Alternative to Use American Society of Mechanical Engineers Code Case N-711-2, "Alternative Examination Coverage Requirements for Examination Category B-F, B-J, C-F-1, C-F-2, and R-A Piping Welds, Section XI, Division 1"

Arkansas Nuclear One, Units 1 and 2
NRC Docket Nos. 50-313 and 50-368
Renewed Facility Operating License Nos. DPR-51 and NPF-6

Grand Gulf Nuclear Station, Unit 1
NRC Docket No. 50-416
Renewed Facility Operating License No. NPF-29

River Bend Station, Unit 1
NRC Docket No. 50-458
Renewed Facility Operating License No. NPF-47

Waterford Steam Electric Station, Unit 3
NRC Docket No. 50-382
Renewed Facility Operating License No. NPF-38

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (z)(1), Entergy Operations, Inc. (Entergy), requests NRC approval of a proposed relief request associated with the Inservice Inspection (ISI) Programs for the cited Entergy nuclear power plants. This request proposes to implement the American Society of Mechanical Engineers (ASME) Code Case N-711-2, "Alternative Examination Coverage Requirements for Examination Category B-F, B-J, C-F-1, C-F-2, and R-A Piping Welds, Section XI, Division 1." This Code Case revision was approved by the ASME Board of Nuclear Codes and Standards in May 2020.

The basis for the proposed alternative is provided in the enclosure to this letter. Entergy requests NRC approval of this multi-site request by January 29, 2022.

This letter contains no new regulatory commitments.

Should you have any questions or require additional information, please contact Ron Gaston, Director, Nuclear Licensing at (601) 368-5138.

Respectfully,

A handwritten signature in black ink, appearing to read "Ron J. Gaston", with a long horizontal flourish extending to the right.

Ron Gaston

RWG/jls

Enclosure: Relief Request EN-20-003, Proposed Alternative to Use ASME Code Case N-711-2

cc: NRC Regional Administrator - Region IV
NRC Senior Resident Inspector (Arkansas Nuclear One, Units 1 and 2)
NRC Senior Resident Inspector (Grand Gulf Nuclear Station, Unit 1)
NRC Senior Resident Inspector (River Bend Station, Unit 1)
NRC Senior Resident Inspector (Waterford Steam Electric Station, Unit 3)
NRC Project Manager (Entergy Fleet)
NRC Project Manager (Arkansas Nuclear One, Units 1 and 2)
NRC Project Manager (Grand Gulf Nuclear Station, Unit 1)
NRC Project Manager (River Bend Station, Unit 1)
NRC Project Manager (Waterford Steam Electric Station, Unit 3)

Enclosure

CNRO2020-00032

Relief Request EN-20-003

Proposed Alternative to Use ASME Code Case N-711-2

Relief Request EN-20-003
Proposed Alternative to Use ASME Code Case N-711-2

Component / Number:	Table IWB-2500-1, Examination Categories B-F and B-J, Table IWC-2500-1, Examination Categories C-F-1 and C-F-2 and Examination Category R-A piping welds
Code Classes:	American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Class 1 and Class 2
References:	ASME Section XI 2007 Edition through 2008 Addenda. ASME Section XI, Division 1, Code Case N-711-2, "Alternative Examination Coverage Requirements for Examination Category B-F, B-J, C-F-1, C-F-2, and R-A Piping Welds" ASME Section XI, Division 1, Code Case N-716-1, "Alternative Classification and Examination Requirements"
Examination Category:	B-F, B-J, C-F-1, C-F-2, and R-A
Description:	Examination Categories B-F and B-J, Table IWC-2500-1, Examination Categories C-F-1 and C-F-2 and Examination Category R-A piping welds
Unit / Interval Applicability:	<u>Arkansas Nuclear One, Unit 1 (ANO-1) / Fifth 10-Year Inservice Inspection (ISI) Interval (May 31, 2017 to May 30, 2027)</u> <u>Arkansas Nuclear One, Unit 2 (ANO-2) / Fourth 10-Year ISI Interval (March 25, 2010 to March 25, 2021)</u> <u>Arkansas Nuclear One, Unit 2 (ANO-2) / Fifth 10-Year ISI Interval (March 25, 2020 to March 25, 2030)</u> <u>Grand Gulf Nuclear Station, GGNS / Fourth 10-Year ISI Interval (December 1, 2017 to November 30, 2026)</u> <u>Waterford 3 Steam Electric Station / WF3, Fourth 10-Year ISI Interval (December 1, 2017 to November 30, 2027)</u> <u>River Bend Station, RBS / Fourth 10-Year ISI Interval (December 1, 2017 to November 30, 2027)</u>

I. APPLICABLE REQUIREMENTS

The code of record for the Entergy Operations, Inc. (Entergy) nuclear fleet is the 2007 edition, including the 2008 addenda, of ASME Section XI. All Entergy sites utilize ASME Code Case N-716-1 for their risk-informed approach to ISI selection and examination. ASME Code Case N-716-1, Table 1, provides the examination volume for components based upon degradation mechanism.

ASME Code Case N-711-2 provides an alternative examination volume based upon an individual component's configuration and its susceptibility to degradation. The degradation mechanisms identified in N-711-2 have also been determined in the ASME Code Case N-716-1 process will be carried forward and applied as allowed by ASME Code Case N-711-2. The use of Code Case N-711-2 does not impact the examination requirements provided in N-716-1.

The NRC has conditionally approved ASME Code Case N-711-1 in Revision 19 of Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," with the condition that ASME Code Case N-711-1 shall not be used to redefine the required examination volume for preservice examinations or when the postulated degradation mechanism for piping welds is Primary Water Stress Corrosion Cracking (PWSCC), or crevice corrosion (CC) degradation mechanisms. The ASME Code Committee approved, with no dissenting ballots, ASME Code Case N-711-2 in May 2020. The only change from revision 1 to revision 2 is the addition of the following paragraph to Section 3, "Evaluation Process:"

(b) Based upon the results of (a), Table 2 is entered at the corresponding Degradation Mechanism and associated Process Decision Point. The alternative examination coverage, based on the potential degradation mechanisms and associated configuration, is defined in Table 2. The acceptable coverage is essentially 100% of the volume of primary interest as defined in Table 2 (essentially 100% coverage is achieved when the applicable examination coverage is greater than 90%; however, in no case shall the examination be terminated when greater than 90% coverage is achieved, if additional coverage of the required examination surface or volume is practical examination coverage less than 100% of the volume of primary interest is not acceptable). Examples of the results of this process for components identified as susceptible to thermal fatigue and IGSCC (PWRs) are provided in Figure 2.

ASME Code Case N-460 provides the concept that 100% coverage is achieved when the applicable examination coverage is greater than 90%. ASME Code Case N-460 was incorporated into IWA-2200(c) of the 2007 edition of ASME Section XI.

As stated above, ASME Code Case N-711-2 incorporates terminology that "essentially" 100% examination coverage is permitted as noted in ASME Section XI.

II. REQUEST FOR RELIEF

Entergy requests relief to apply the ASME Code Case N-711-2 alternative examination volume for Examination Categories B-F, B-J, C-F-1, C-F-2 and Examination Category R-A piping welds in instances where coverage of the Code Case N-716-1 examination volume is not "essentially" 100% due to configuration and material limitations. Code Case N-711-2 provides an alternative examination volume based upon a component's configuration and its susceptibility to degradation. Code Case N-711-2 does not impact the examination requirements defined in

Code Case N-716-1. Entergy will not deviate from the requirements of Code Case N-711-2. Entergy will continue to comply with the NRC's conditions placed on the use of ASME Code Case N-711-1.

III. BASIS FOR RELIEF

ASME Code Case N-716-1, Table 1, provides the examination volume for components based upon degradation mechanism. There are instances where the examination volume cannot be met due to examination limitations such as single-side examinations and cast material.

In accordance with ASME Section XI, IWA-2200(c), all nondestructive examinations of the required examination surface or volume shall be conducted to the maximum extent practical. When performing VT-1, surface, radiographic, or ultrasonic examination on a component with defined surface or volume, essentially 100% of the required surface or volume shall be examined. Essentially 100% coverage is achieved when the applicable examination coverage is greater than 90%; however, in no case shall the examination be terminated when greater than 90% coverage is achieved, if additional coverage of the required examination surface or volume is practical.

Ultrasonic examination technology is limited in capability to qualify equipment, procedures and personnel for single-sided examinations of austenitic stainless steel pipe-to-component and pipe-to-CASS (Cast Austenitic Stainless Steel) components to the requirements of 10 CFR 50.55a(b)(2)(xvi)(B). Current qualified ultrasonic examination procedures generally yield examination coverages at approximately 50% for the austenitic applications. Ultrasonic examination techniques applied to CASS material consistent with ASME Section XI, Appendix III are not practical given the restricted outer surface geometry and the inherent limitations caused by the CASS material structure.

Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," as conditioned by 10 CFR 50.55a(b)(2)(xv)(A)(1), requires examinations of austenitic welds from both sides. If examination from both sides is not possible, procedures and personnel qualified for single-side examination in accordance with Appendix VIII, Supplement 2, and Supplement 10, respectively, with all flaws on the opposite end of the welds, shall be used to examine the required volume.

As discussed above, ASME Code Case N-711-2 provides an alternative examination volume based upon individual component degradation mechanism. All Entergy sites are utilizing ASME Code Case N-716-1 for their risk informed approach to ISI selection and examination. The degradation mechanisms determined in the ASME Code Case N-716-1 process will be used to determine the specific examination volume as required by ASME Code Case N-711-2.

Conclusions

Compared to current ASME Section XI requirements, ASME Code Case N-711-2 provides a more informed examination volume based on a component's configuration and susceptibility to degradation, provided all requirements of the code case ASME Code Case N-711-2 are met.

Applying qualified ultrasonic procedures, personnel and equipment to the examination volumes defined in ASME Code Case N-711-2 will provide an acceptable level of quality and safety

Therefore, Entergy requests that the NRC authorize this proposed alternative in accordance with 10 CFR 50.55a(z)(1).

IV. PROPOSED ALTERNATIVE

Entergy is proposing that if the volume of primary interest determined by ASME Code Case N-711-2 can be examined to essentially 100%, that relief from the requirements 10 CFR 50.55a(g)(6)) will not need to be requested and granted for Examination Categories B-F, B-J, C-F-1, C-F-2 and Examination Category R-A piping welds.

V. PRECEDENT

None

VI. CONCLUSION

From 10 CFR 50.55a:

(z) Alternatives to codes and standards requirements. Alternatives to the requirements of paragraphs (b) through (h) of this section or portions thereof may be used when authorized by the Director, Office of Nuclear Reactor Regulation, or Director, Office of New Reactors, as appropriate. A proposed alternative must be submitted and authorized prior to implementation. The applicant or licensee must demonstrate that:

- (1) *Acceptable level of quality and safety.* The proposed alternative would provide an acceptable level of quality and safety; or
- (2) *Hardship without a compensating increase in quality and safety.* Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Based on foregoing discussion, Entergy has determined that the conditions of 10 CFR 50.55a(z)(1) are met in that ASME Code Case N711-2 provides a more informed examination volume based on a component's configuration and susceptibility to degradation. The use of ASME Code Case N-711-2 to determine the volume of primary interest provides an acceptable level of quality and safety.

VII. REFERENCES

1. ASME Code Case N-716-1, "Alternative Classification and Examination Requirements"