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U. S. Nuclear Regulatory Commission  
Attn.: Document Control Desk  
Mail Stop OP1-17  
Washington, DC 20555-0001

Subject: Entergy Operations, Inc.  
Alternative to ASME Code Requirements

Arkansas Nuclear One - Units 1 & 2	Waterford Steam Electric Station - Unit 3
Docket Nos. 50-313 & 50-368	Docket No. 50-382
License Nos. DPR-51 & NPF-6	License No. NPF-38

Reference: NRC letter dated December 1, 1998, "Relief Request Related to the Removal of Insulation on ASME Code Class 1 and 2 Systems During Inservice Inspection for Waterford Steam Electric Station, Unit 3, and Arkansas Nuclear One, Unit 2 (TAC Nos. MA0810 and MA0733)"

CNRO-2000-00010

By letter dated December 1, 1998, the NRC authorized Entergy Operations, Inc. (Entergy) the use of a proposed alternative (ISI2-09, Rev. 0) to certain provisions of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code). Specifically, the NRC authorized a proposed alternative to the requirements of ASME Section XI, Subarticle IWA-5242(a) for pressure-retaining bolted connections in ASME Class 1 and 2 boroated systems. The NRC authorized ISI2-09 to be used at Arkansas Nuclear One - Unit 2 (ANO-2) and Waterford Steam Electric Station - Unit 3 (W3).<sup>1</sup> The NRC authorized the use of this methodology for Class 1 systems at Arkansas Nuclear One - Unit 1 (ANO-1).<sup>2</sup>

<sup>1</sup> Letter dated December 1, 1998, "Relief Request Related to the Removal of Insulation on ASME Code Class 1 and 2 Systems During Inservice Inspection for Waterford Steam Electric Station, Unit 3, and Arkansas Nuclear One, Unit 2 (TAC Nos. MA0810 and MA0733)"

<sup>2</sup> Letter dated April 17, 1998, "Relief Authorization for Use of Code Case N-533 for Arkansas Nuclear One, Unit 1 (TAC No. M99243)"

ADH 7/1

Pursuant to 10CFR50.55a(a)(3)(i), Entergy requests the following:

1. Expand the scope of authorized alternative ISI2-09, Rev. 0 to include ASME Class 3 borated systems
2. Revise the previously authorized associated alternative examinations.
3. Apply the proposed request to ANO-1.

A revision to ISI2-09, designated as Relief Request CEP-ISI-002, Rev. 0 (see attachment) identifies the specific request and provides the associated basis and justification for application at ANO-1, ANO-2, and W3. Revision bars in the page margins denote text changes from ISI2-09.

Relief Request CEP-ISI-002, Rev. 0 is needed to support the upcoming refueling outages at ANO-2 and Waterford 3, currently scheduled to begin in the autumn of 2000. Therefore, Entergy requests the NRC review and authorize use of CEP-ISI-002 on or before August 31, 2000 to support this schedule.

This letter contains no commitments.

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

Very truly yours,



MAK/GHD/baa  
attachment

cc:

Mr. C. G. Anderson (N-GSB)  
Mr. C. M. Dugger (W-GSB-300)  
Mr. G. J. Taylor (M-ECH-65)

Mr. T. W. Alexion, NRR Project Manager (ANO-2)  
Mr. R. L. Bywater, NRC Senior Resident Inspector (ANO)  
Mr. T. R. Farnholtz, NRC Senior Resident Inspector (W3)  
Mr. N. Kalyanam, NRR Project Manager (W3)  
Mr. E. W. Merschoff, NRC Regional Administrator, Region IV  
Mr. M. C. Nolan, NRR Project Manager (ANO-1)

**RELIEF REQUEST**  
**CEP-ISI-002, Rev. 0**

Component Number:	Bolted connections in systems borated for controlling reactivity
Code Class:	1, 2, 3
References:	IWA-5242(a)
Examination Category:	B-P, C-H, D-B
Item Number:	All
Description:	System pressure test for insulated components
Unit/Inspection Interval	ANO-1 - third (3 <sup>rd</sup> ) 10-year interval
Applicability:	ANO-2 – third (3 <sup>rd</sup> ) 10-year interval Waterford 3 – second (2 <sup>nd</sup> ) 10-year interval

I. Code Requirement

ASME Section XI, 1992 Edition, Subarticle IWA-5242(a) states that for systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure-retaining bolted connections for a direct VT-2 visual examination. The VT-2 examination must be performed at system test pressure in accordance with IWA-5211.

II. Requested Authorization

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy proposes alternative examinations to removing insulation for VT-2 visual examinations of bolted connections in ASME Code Class 1, 2, and 3 borated systems during system pressure tests, as required by IWA-5242(a).

III. Proposed Alternative Examinations

Entergy proposes alternative examinations utilizing current material control programs and additional inspection activities as discussed below.

1. A system leakage test shall be performed on each bolted connection in systems borated for the purpose of controlling reactivity, as required by IWA-5213(a), with the exception that the insulation need not be removed. If evidence of leakage is detected either by discovery of active leakage or by evidence of boric acid crystals, the insulation shall be removed and the bolted connection re-examined. If necessary, the connection shall be evaluated in accordance with the corrective measures of IWA-5250.
2. Per current Code requirements of IWA-5242(a), insulation at bolted connections in systems borated for the purpose of controlling reactivity shall be removed per the following schedules:

- a. ASME Code Class 1 systems – once during each refueling outage
- b. ASME Code Class 2 and Class 3 systems – once during each inspection period

However, the VT-2 visual examination for Class 1, 2, and 3 systems may be performed at cold conditions. The connection is not required to be pressurized. Any evidence of leakage shall be evaluated in accordance with IWA-5250.

#### IV. Basis for the Proposed Alternative Examinations

Entergy proposes alternative examinations to the requirements of IWA-5242(a) during system pressure tests for the following reasons:

1. ASME Code Class 1, 2, and 3 systems borated for the purpose of controlling reactivity are large, extensive systems that extend into multiple plant areas and elevations. A large portion of the system pressure tests is tied to a required surveillance test or plant startup evolution. Scaffolding is required to access many of the bolted connections. In addition, many of these connections are located in difficult to access areas and in medium to high radiation areas. In order to identify leakage, the preferred time frame to perform this inspection is prior to beginning the surveillance test or at the beginning of the outage. Removing insulation during operation combined with scaffolding requirements result in increased personnel exposure, additional radwaste, and increased financial cost.
2. Visual VT-2 examinations of Class 1 systems, primarily the Reactor Coolant System (RCS) piping and components, are performed while raising temperature during plant startup. During such times, the RCS is at normal operating pressure of approximately 2250 psig with reactor coolant temperature between 350°F and 550°F. (These parameters are controlled by each plant's specific Technical Specifications and procedures for this condition.) Performing a visual VT-2 examination, installing insulation, and removing scaffolding at bolted connections under these operating conditions represents a personnel safety hazard. The VT-2 examination is a critical path activity normally taking six to eight hours to perform. Since the majority of Class 1 piping is inside the containment building secondary shield wall, removing and reinstalling insulation along with disassembly of scaffolding may substantially increase the outage duration.
3. In response to NRC Generic Letter 88-05, "Boric Acid Corrosion Of Carbon Steel Reactor Pressure Boundary Components In PWR Plants," Entergy established a program to inspect boric acid leaks discovered in the containment building and to evaluate the impact of those leaks on carbon steel or low alloy steel components. Per this program, evidence of leaks, including boric acid crystals or residue, is inspected and evaluated regardless of whether the leak was discovered at power or during an outage. Based on the evaluation, appropriate corrective actions are initiated to prevent recurrence of the leak and to repair, if necessary, any degraded materials or components.

4. To ensure that degradation mechanisms in stainless steels are mitigated, Entergy maintains a program for controlling materials (insulation, thread lubricant, etc.) that may come in contact with safety-related components, including bolting. This program ensures impurities are not present in concentrations that would promote development of stress corrosion cracking in stainless steel bolted connections.

At both ANO units and Waterford 3, the only carbon steel and low alloy pressure boundary components in systems borated for the purpose of controlling reactivity are clad with stainless steel. Specifically, these clad components are the reactor vessel, steam generators (primary side), pressurizer, and portions of the reactor coolant system piping. Other pressure boundary piping and components in borated systems within inservice inspection boundaries are constructed of stainless steel. There is substantial information, such as EPRI NP-5679, attesting to the resistance of stainless steels to boric acid corrosion.

#### V. Conclusion

10CFR50.55a(a)(3) states:

“Proposed alternatives to the requirements of (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

- (i) The proposed alternatives would provide an acceptable level of quality and safety, or
- (ii) 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.”

Entergy believes the proposed alternative examinations presented above provide an acceptable level of quality and safety for ensuring the integrity of bolted connections in systems borated for reactivity control. Therefore, we request the proposed alternative be authorized pursuant to 10CFR50.55a(a)(3)(i).