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Michael A. Krupa  
Director  
Nuclear Safety & Licensing

CNRO-2003-00034

August 27, 2003

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

**SUBJECT:** Entergy Operations, Inc.  
Relaxation Request to NRC Order EA-03-009 for the Vent Line Nozzle

Arkansas Nuclear One, Unit 2  
Docket No. 50-368  
License No. NPF-29

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

**REFERENCE:**

1. Entergy Letter to the NRC, "Relaxation Requests to NRC Order EA-03-009," dated July 1, 2003 (CNRO-2003-00027)
2. Entergy Letter to the NRC, "Response to Request for Additional Information Pertaining to Relaxation Requests to NRC Order EA-03-009", dated July 24, 2003 (CNRO-2003-00030)

Dear Sir or Madam:

In Reference 1, Entergy Operations, Inc. (Entergy) had requested relaxation from Section IV.C(1)(b) of NRC Order EA-03-009 for Arkansas Nuclear One, Units 1 and 2 (ANO-1 and ANO-2), and Waterford Steam Electric Station, Unit 3 (Waterford 3). That relaxation request pertained to both the vent line nozzle and the in-core instrumentation (ICI) nozzles. In telephone calls held on July 14 and July 15, 2003, representatives of the NRC staff and Entergy discussed these requests. As a result of those discussions, Entergy submitted revisions to the requests for ANO-2 and Waterford 3 and withdrew the ANO-1 request in Reference 2.

In further discussions with the NRC, Entergy noted that it was considering additional analysis-based relaxations for the ICI nozzles. It was agreed that Entergy would consolidate the ICI nozzle relaxation in a single submittal. On that basis, please disregard the portion of the requests in Reference 2 that pertains to the ICI nozzles. Entergy requests NRC review and approval of only the vent line nozzle portion of that relaxation request. Entergy has updated the requests to remove the ICI information and the enclosed ANO-2 and Waterford 3 relaxation requests supersede the previous versions in their entirety.

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Entergy requests approval of these proposed relaxation requests by September 18, 2003, in order to support inspection activities scheduled during the upcoming fall 2003 refueling outages at ANO-2 and Waterford 3. Entergy plans to submit the consolidated ICI nozzle relaxation request for ANO-2 and Waterford 3 shortly.

This letter contains no new commitments. Should you have any questions, please contact Guy Davant at (601) 368-5756.

Sincerely,



MAK/FGB/bal

- Enclosure:
1. Vent Line Nozzle Relaxation Request for Arkansas Nuclear One, Unit 2
  2. Vent Line Nozzle Relaxation Request for Waterford Steam Electric Station, Unit 3
  3. Summary of Commitments

cc: Mr. C. G. Anderson (ANO)  
Mr. W. A. Eaton (ECH)  
Mr. G. D. Pierce (ECH)  
Mr. J. E. Venable (W3)

Mr. T. W. Alexion, NRR Project Manager (ANO-2)  
Mr. R. L. Bywater, NRC Senior Resident Inspector (ANO)  
Mr. T. P. Gwynn, NRC Region IV Regional Administrator  
Mr. M. C. Hay, NRC Senior Resident Inspector (W3)  
Mr. N. Kalyanam, NRR Project Manager (W3)

**ENCLOSURE 1**

**CNRO-2003-00034**

**ARKANSAS NUCLEAR ONE, UNIT 2  
VENT LINE NOZZLE RELAXATION REQUEST**

**ENTERGY OPERATIONS, INC.  
ARKANSAS NUCLEAR ONE, UNIT 2  
VENT LINE NOZZLE RELAXATION REQUEST TO NRC ORDER EA-03-009**

**I. COMPONENT/EXAMINATION**

Component/Number: 2R-1

Description: Reactor Pressure Vessel (RPV) head penetration nozzles

Code Class: 1

References:

1. NRC Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated February 11, 2003
2. Letter 2CAN020304 from Entergy Operations, Inc. to the NRC, "Entergy Operations, Inc. – Answer to Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors", dated February 28, 2003

Unit: Arkansas Nuclear One, Unit 2 (ANO-2)

Inspection Interval: Third (3rd) 10-Year Interval

**II. REQUIREMENTS**

The NRC issued Order EA-03-009 (the Order) that modified the current licenses at nuclear facilities utilizing pressurized water reactors (PWRs), which includes ANO-2. The Order establishes inspection requirements for RPV head penetration nozzles. ANO-2 is categorized as a "High" primary water stress corrosion cracking (PWSCC) susceptibility plant based on an effective degradation year (EDY) value greater than 12.

According to Section IV.C.1(b) of the Order, RPV head penetration nozzles in the "High" PWSCC susceptibility category shall be inspected using *either* of the following non-destructive examination (NDE) techniques each refueling outage:

- (i) Ultrasonic testing (UT) of *each* RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, *or*
- (ii) Eddy current testing (ECT) or dye penetrant testing (PT) of the wetted surface of *each* J-groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.

### **III. PROPOSED ALTERNATIVES**

The ANO-2 RPV head has ninety (90) penetration nozzles that include eighty-one (81) Control Element Drive Mechanism (CEDM) nozzles, eight (8) Incore Instrument (ICI) nozzles, and one (1) vent line nozzle. Entergy Operations, Inc. (Entergy) requests relaxation from and proposes an alternative to the requirements of the Order as discussed below.

#### **NDE Inspection Technique for the Vent Line Nozzle**

Entergy understands that the Order requires the same technique, specified in Section IV.C(1)(b), be used to inspect the entire population of RPV head penetration nozzles; combining techniques or using one technique on one nozzle and the other technique on another nozzle is not permitted.

Entergy plans to inspect the CEDM and ICI nozzles using the UT inspection technique as specified in Section IV.C(1)(b)(i) of the Order or in accordance with approved relaxation requests. In lieu of using the UT inspection technique on every RPV head penetration nozzle, Entergy requests authorization to inspect the vent line nozzle and J-groove weld using the ECT technique per Section IV.C(1)(b)(ii) of the Order.

As required by the Order, a 60-day report for ANO-2 will be submitted and will include specific inspection information; i.e., type, extent, and results of inspections performed.

### **IV. BASIS FOR PROPOSED ALTERNATIVES**

#### **NDE Inspection Technique for the Vent Line Nozzle**

The Order requires inspecting the entire population of RPV head penetration nozzles using only one of the techniques specified in Section IV.C(1)(b). This limits the licensee's options without measurably increasing the level of quality or safety. Entergy believes that using either inspection technique is sufficient to detect the PWSCC phenomena, and that no significant benefit is gained by requiring the same technique to be used on all nozzles.

Conditions at ANO-2 warrant using a different technique on different nozzles due to nozzle configuration. Specifically, the UT inspection probe used to examine the CEDM and ICI nozzles is not suitable for the leakage assessment due to the lack of an interference fit on the smaller vent line nozzle; therefore, Entergy proposes to use a different technique (ECT) to perform this inspection, as requested in Section III above.

## **V. CONCLUSION**

Section IV.F of NRC Order EA-03-009 states:

"Licensees proposing to deviate from the requirements of this Order shall seek relaxation of this Order pursuant to the procedure specified below. The Director, Office of Nuclear Reactor Regulation, may, in writing, relax or rescind any of the above conditions upon demonstration by the Licensee of good cause. A request for relaxation regarding inspection of specific nozzles shall also address the following criteria:

- (1) The proposed alternative(s) for inspection of specific nozzles will provide an acceptable level of quality and safety, or
- (2) Compliance with this Order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

Entergy believes the requested authorization to use ECT on the vent line nozzle (Section III above) maintains the level of quality and safety prescribed in Section IV.C(1)(b) based upon the justification provided in Section IV, above. Therefore, Entergy requests that the proposed alternative be authorized pursuant to Section IV.F of the Order.

**ENCLOSURE 2**

**CNRO-2003-00034**

**WATERFORD STEAM ELECTRIC STATION, UNIT 3  
VENT LINE NOZZLE RELAXATION REQUEST**

**ENTERGY OPERATIONS, INC.  
WATERFORD STEAM ELECTRIC STATION, UNIT 3  
VENT LINE NOZZLE RELAXATION REQUEST TO NRC ORDER EA-03-009**

**I. COMPONENT/EXAMINATION**

Component/Number: MRCT0001

Description: Reactor Pressure Vessel (RPV) head penetration nozzles

Code Class: 1

References:

1. NRC Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated February 11, 2003
2. Letter WF3F1-2003-0014 from Entergy Operations, Inc. to the NRC, "Entergy Operations, Inc. – Answer to Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors", dated February 28, 2003

Unit: Waterford Steam Electric Station, Unit 3 (Waterford 3)

Inspection Interval: Second (2<sup>nd</sup>) 10-Year Interval

**II. REQUIREMENTS**

The NRC issued Order EA-03-009 (the Order) that modified the current licenses at nuclear facilities utilizing pressurized water reactors (PWRs), which includes Waterford 3. The Order establishes inspection requirements for RPV head penetration nozzles. Waterford 3 is categorized as a "High" primary water stress corrosion cracking (PWSCC) susceptibility plant based on an effective degradation year (EDY) value greater than 12.

According to Section IV.C.1(b) of the Order, RPV head penetration nozzles in the "High" PWSCC susceptibility category shall be inspected using *either* of the following non-destructive examination (NDE) techniques each refueling outage:

- (1) Ultrasonic testing (UT) of *each* RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, *or*
- (2) Eddy current testing (ECT) or dye penetrant testing (PT) of the wetted surface of *each* J-groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.

### **III. PROPOSED ALTERNATIVES**

The Waterford 3 RPV head has one hundred-two (102) penetration nozzles that include ninety-one (91) Control Element Drive Mechanism (CEDM) nozzles, ten (10) Incore Instrument (ICI) nozzles, and one (1) vent line nozzle. Entergy Operations, Inc. (Entergy) requests relaxation from and proposes an alternative to the requirements of the Order as discussed below.

#### **NDE Inspection Technique for the Vent Line Nozzle**

Entergy understands that the Order requires the same technique, specified in Section IV.C(1)(b), be used to inspect the entire population of RPV head penetration nozzles; combining techniques or using one technique on one nozzle and the other technique on another nozzle is not permitted.

Entergy plans to inspect the CEDM and ICI nozzles using the UT inspection technique as specified in Section IV.C(1)(b)(i) of the Order or in accordance with approved relaxation requests. In lieu of using the UT inspection technique on every RPV head penetration nozzle, Entergy requests authorization to inspect the vent line nozzle and J-groove weld using the ECT technique per Section IV.C(1)(b)(ii) of the Order.

As required by the Order, a 60-day report for Waterford 3 will be submitted and will include specific inspection information; i.e., type, extent, and results of inspections performed.

### **IV. BASIS FOR PROPOSED ALTERNATIVES**

#### **NDE Inspection Technique for the Vent Line Nozzle**

The Order requires inspecting the entire population of RPV head penetration nozzles using only one of the techniques specified in Section IV.C(1)(b). This limits the licensee's options without measurably increasing the level of quality or safety. Entergy believes that using either inspection technique is sufficient to detect the PWSCC phenomena, and that no significant benefit is gained by requiring the same technique to be used on all nozzles.

Conditions at Waterford 3 warrant using a different technique on different nozzles due to nozzle configuration. Specifically, the UT inspection probe used to examine the CEDM and ICI nozzles is not suitable for the leakage assessment due to the lack of an interference fit on the smaller vent line nozzle; therefore, Entergy proposes to use a different technique (ECT) to perform this inspection, as requested in Section III, above.

**V. CONCLUSION**

Section IV.F of NRC Order EA-03-009 states:

"Licensees proposing to deviate from the requirements of this Order shall seek relaxation of this Order pursuant to the procedure specified below. The Director, Office of Nuclear Reactor Regulation, may, in writing, relax or rescind any of the above conditions upon demonstration by the Licensee of good cause. A request for relaxation regarding inspection of specific nozzles shall also address the following criteria:

- (1) The proposed alternative(s) for inspection of specific nozzles will provide an acceptable level of quality and safety, or
- (2) Compliance with this Order for specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

Entergy believes the requested authorization to use ECT on the vent line nozzle (Section III, above) maintains the level of quality and safety prescribed in Section IV.C(1)(b) based upon the justification provided in Section IV, above. Therefore, Entergy requests that the proposed alternative be authorized pursuant to Section IV.F of the Order.

**ENCLOSURE 3**

**CNRO-2003-00034**

**SUMMARY OF COMMITMENTS**

### SUMMARY OF COMMITMENTS

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
<p>For ANO-2, Enclosure 1, Section III:</p> <p>As required by the Order, a 60-day report will be submitted and will include specific inspection information; i.e., type, extent, and results of inspections performed.</p>	✓		60 days after startup from the next refueling outage
<p>For Waterford 3, Enclosure 2, Section III:</p> <p>As required by the Order, a 60-day report will be submitted and will include specific inspection information; i.e., type, extent, and results of inspections performed.</p>	✓		60 days after startup from the next refueling outage