Entergy

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Michael A. Krupa
Director
Nuclear Safety & Licensing

CNRO-2003-00027

July 1, 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

Arkansas Nuclear One, Units 1 and 2
Docket Nos. 50-313 and 50-416
License Nos. DPR-51 and NPF-29

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

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 from the NRC to Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Unit 2 – Relaxation of the Requirements of Order (EA-03-009) Regarding Reactor Pressure Vessel Head Inspections (TAC No. MB9543)," dated June 17, 2003

Pursuant to Section IV.F of NRC Order EA-03-009 (Reference #1), Entergy Operations, Inc. (Entergy) requests relaxation from Section IV.C(1)(b) of the Order for Arkansas Nuclear One, Units 1 (ANO-1) and 2 (ANO-2), and Waterford Steam Electric Station, Unit 3 (Waterford 3). Specifically, Section IV.C(1)(b) of the Order requires either an ultrasonic test (UT) or a wetted surface examination using eddy current testing (ECT) or dye penetrant testing (PT) be performed on the total population of reactor pressure vessel (RPV) head penetration nozzles. Compliance with Section IV.C(1)(b) does not allow the use of, or a combination of, both inspection techniques. Enclosures 1, 2, and 3 of this letter contain the relaxation requests for ANO-1, ANO-2, and Waterford 3, respectively.

The NRC recently approved a similar relaxation request for D. C. Cook Nuclear Plant, Unit 2, as documented in Reference #2. In its safety evaluation approving the D. C. Cook request, the NRC staff stated that the alternative "provides reasonable assurance of the structural integrity of the RPV head."

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Entergy requests approval of this proposed relaxation request by August 1, 2003 in order to support inspection activities scheduled during the upcoming fall 2003 refueling outages at ANO-2 and Waterford 3.

This letter contains no commitments.

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

Sincerely,

M. A Krupa

MAK/GHD/bal

Enclosures:
1. Relaxation Request for Arkansas Nuclear One, Unit 1
2. Relaxation Request for Arkansas Nuclear One, Unit 2
3. Relaxation Request for Waterford Steam Electric Station, Unit 3

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)
Mr. J. L. Minns, NRR Project Manager (ANO-1)

ENCLOSURE 1

CNRO-2003-00027

RELAXATION REQUEST FOR
ARKANSAS NUCLEAR ONE, UNIT 1

ENTERGY OPERATIONS, INC.
ARKANSAS NUCLEAR ONE, UNIT 1
RELAXATION REQUEST TO NRC ORDER EA-03-009

I. COMPONENT/EXAMINATION

Component/Number: 1R-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 1CAN020302 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
3. Letter from the NRC to Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Unit 2 – Relaxation of the Requirements of Order (EA-03-009) Regarding Reactor Pressure Vessel Head Inspections (TAC No. MB9543)," dated June 17, 2003

Unit: Arkansas Nuclear One, Unit 1 (ANO-1)

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-1. The NRC Order establishes inspection requirements for RPV head penetration nozzles. ANO-1 is categorized as a "High" PWSCC susceptibility plant based on the fact that the ANO-1 RPV head has experienced cracking and that the effective degradation year value is 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 methods 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.

Entergy Operations, Inc. (Entergy) understands that the Order requires the same technique be used to inspect ***every*** RPV head penetration nozzle; combining techniques or using one technique on one nozzle and the other on another nozzle is not allowed.

III. PROPOSED ALTERNATIVE

The ANO-1 RPV head has sixty nine (69) penetration nozzles that include sixty-eight (68) Control Rod Drive Mechanism (CRDM) nozzles and one (1) radiation calibration instrument nozzle.

In lieu of performing RPV head penetration nozzle inspections as prescribed in Section IV.C(1)(b) of NRC Order EA-03-009, Entergy proposes to use, for each RPV head penetration nozzle, one of the following techniques:

(1) UT of the 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) ECT or PT of the wetted surface of the J-groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld, ***or***

(3) A combination of UT, ECT, and/or PT of the RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle.

IV. BASIS FOR PROPOSED ALTERNATIVE

Entergy currently plans to use the inspection techniques prescribed in NRC Order EA-03-009 to inspect RPV head penetration nozzles, to the extent practicable. However, requiring inspections of all RPV head penetration nozzles to use only one of the techniques [either UT or ECT/PT] limits the licensee's options without increasing the level of quality or safety. Either inspection technique or combining techniques is sufficient to detect the primary water stress corrosion cracking (PWSCC) phenomena. In addition, there is no benefit gained by requiring the same technique to be used on all nozzles. Conditions may warrant the use of different techniques on different nozzles (e.g., nozzle configuration). Exclusive use of either technique does not increase the level of quality or safety.

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."

The NRC recently approved a similar relaxation request for D. C. Cook Nuclear Plant, Unit 2, as documented in Reference #3. In its safety evaluation approving the D. C. Cook request, the NRC staff stated that the alternative "provides reasonable assurance of the structural integrity of the RPV head." Similar to the D. C. Cook request, Entergy believes this proposed alternative 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-2003-00027

RELAXATION REQUEST FOR
ARKANSAS NUCLEAR ONE, UNIT 2

ENTERGY OPERATIONS, INC.
ARKANSAS NUCLEAR ONE, UNIT 2
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
3. Letter from the NRC to Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Unit 2 – Relaxation of the Requirements of Order (EA-03-009) Regarding Reactor Pressure Vessel Head Inspections (TAC No. MB9543)," dated June 17, 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 NRC Order establishes inspection requirements for RPV head penetration nozzles. ANO-2 is categorized as a "High" 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 methods 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.

Entergy Operations, Inc. (Entergy) understands that the Order requires the same technique be used to inspect ***every*** RPV head penetration nozzle; combining techniques or using one technique on one nozzle and the other on another nozzle is not allowed.

III. PROPOSED ALTERNATIVE

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.

In lieu of performing RPV head penetration nozzle inspections as prescribed in Section IV.C(1)(b) of NRC Order EA-03-009, Entergy proposes to use, for each RPV head penetration nozzle, one of the following techniques:

(1) UT of the 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) ECT or PT of the wetted surface of the J-groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld, ***or***

(3) A combination of UT, ECT, and/or PT of the RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle.

IV. BASIS FOR PROPOSED ALTERNATIVE

Entergy currently plans to use the inspection techniques prescribed in NRC Order EA-03-009 to inspect RPV head penetration nozzles, to the extent practicable. However, requiring inspections of all RPV head penetration nozzles to use only one of the techniques [either UT or ECT/PT] limits the licensee's options without increasing the level of quality or safety. Either inspection technique or combining techniques is sufficient to detect the primary water stress corrosion cracking (PWSCC) phenomena. In addition, there is no benefit gained by requiring the same technique to be used on all nozzles. Conditions may warrant the use of different techniques on different nozzles (e.g., nozzle configuration). Exclusive use of either technique does not increase the level of quality or safety.

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."

The NRC recently approved a similar relaxation request for D. C. Cook Nuclear Plant, Unit 2, as documented in Reference #3. In its safety evaluation approving the D. C. Cook request, the NRC staff stated that the alternative "provides reasonable assurance of the structural integrity of the RPV head." Similar to the D. C. Cook request, Entergy believes this proposed alternative 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-2003-00027

RELAXATION REQUEST FOR
WATERFORD STEAM ELECTRIC STATION, UNIT 3

ENTERGY OPERATIONS, INC.
WATERFORD STEAM ELECTRIC STATION, UNIT 3
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
3. Letter from the NRC to Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Unit 2 – Relaxation of the Requirements of Order (EA-03-009) Regarding Reactor Pressure Vessel Head Inspections (TAC No. MB9543)," dated June 17, 2003

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

Inspection Interval: Second (2^{nd}) 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 NRC Order establishes inspection requirements for RPV head penetration nozzles. Waterford 3 is categorized as a "High" 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 methods 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.

Entergy Operations, Inc. (Entergy) understands that the Order requires the same technique be used to inspect ***every*** RPV head penetration nozzle; combining techniques or using one technique on one nozzle and the other on another nozzle is not allowed.

III. PROPOSED ALTERNATIVE

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.

In lieu of performing RPV head penetration nozzle inspections as prescribed in Section IV.C(1)(b) of NRC Order EA-03-009, Entergy proposes to use, for each RPV head penetration nozzle, one of the following techniques:

(1) UT of the 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) ECT or PT of the wetted surface of the J-groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld, ***or***

(3) A combination of UT, ECT, and/or PT of the RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle.

IV. BASIS FOR PROPOSED ALTERNATIVE

Entergy currently plans to use the inspection techniques prescribed in NRC Order EA-03-009 to inspect RPV head penetration nozzles, to the extent practicable. However, requiring inspections of all RPV head penetration nozzles to use only one of the techniques [either UT or ECT/PT] limits the licensee's options without increasing the level of quality or safety. Either inspection technique or combining techniques is sufficient to detect the primary water stress corrosion cracking (PWSCC) phenomena. In addition, there is no benefit gained by requiring the same technique to be used on all nozzles. Conditions may warrant the use of different techniques on different nozzles (e.g., nozzle configuration). Exclusive use of either technique does not increase the level of quality or safety.

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