UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 6, 2010

Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 – REQUEST FOR ALTERNATIVE W3-ISI-015, INSPECTION OF REACTOR VESSEL HEAD IN-CORE INSTRUMENT NOZZLES DURING THIRD 10-YEAR INSERVICE INSPECTION INTERVAL (TAC NO. ME2401)

Dear Sir or Madam:

By letter dated October 19, 2009, as supplemented by letter dated November 2, 2009, Entergy Operations, Inc. (the licensee), submitted Request for Alternative W3-ISI-015, requesting relief from the inspection requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Case N-729-1, "Alternative Examination Requirements for PWR [Pressurized-Water Reactor] Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1," as required and conditioned by paragraph 50.55a(g)(6)(ii)(D) of Title 10 of the *Code of Federal Regulations* (10 CFR), for Waterford Steam Electric Station, Unit 3 (Waterford 3), for the fall 2009 refueling outage (RF 16) during the third 10-year inservice inspection (ISI) interval.

Specifically, the licensee stated that, due to the inability to qualify the ultrasonic examination (UT) techniques and personnel for examination of in-core instrument (ICI) nozzle tubes at Waterford 3 in accordance with the requirements of 10 CFR 50.55a(g)(6)(ii)(D)(4), the required surface examination of the ICI nozzle tube to the extent specified by Code Case N-729-1, as required and conditioned by 10 CFR 50.55a(g)(6)(ii)(D)(3), would result in hardship due to significant personnel radiation exposure without a compensating increase in the level of quality and safety.

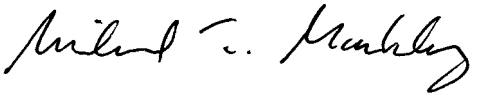
The licensee proposes to perform an eddy current (ET) examination of the inside diameter (ID) and bottom surfaces of the nozzle tube. As for the outside diameter (OD) surface, instead of the ET, the licensee proposes to perform a volumetric examination of the nozzle tube on the ID to detectable extent of the nozzle tube below the J-groove weld and on the lower end surface using time of flight diffraction UT examination. Where the UT data quality between the J-groove weld root to 1-inch below the J-groove weld root is determined to be unacceptable, a compensatory ET examination of the ICI nozzle tube OD surface will be performed. In addition, the licensee stated that the finite element and fracture mechanics crack growth analyses show that a postulated through-wall crack in the region of nozzle below the J-groove weld root will not propagate to the root within one remaining operating cycle, when the reactor pressure vessel head is replaced (during the next refueling outage).

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's request and determined that the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the subject ICI nozzles, and that complying with the requirements of Code Case N-729-1, as required and conditioned by 10 CFR 50.55a(g)(6)(ii)(D), would result in a hardship due to significant personnel radiological exposure without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the use of the proposed alternative for the third 10-year ISI interval at Waterford 3, for the 16th operating cycle, beginning in fall of 2009, up to the commencement of the 17th refueling outage in spring of 2011 when the reactor pressure vessel head is replaced. Due to the immediate need of this relief for alternative request, verbal authorization for the use of the request was granted on November 4, 2009, for Waterford 3.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

The staff's safety evaluation is enclosed.

Sincerely,



Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure:
Safety Evaluation

cc w/encl.: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ALTERNATIVE W3-ISI-015

INSPECTION OF IN-CORE INSTRUMENT NOZZLE

DURING THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

WATERFORD STEAM ELECTRIC STATION, UNIT 3

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-382

## 1.0 INTRODUCTION

By letter dated November 2, 2009 (Reference 1), which superseded and supplemented letter dated October 19, 2009 (Reference 2), Entergy Operations, Inc. (the licensee), submitted relief request W3-ISI-015 for U.S. Nuclear Regulatory Commission (NRC) review and approval. The licensee requests relief from the inspection requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Case N-729-1, "Alternative Examination Requirements for PWR [Pressurized-Water Reactor] Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1," as required and conditioned by Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.55a(g)(6)(ii)(D). Specifically, the licensee stated that, due to the inability to qualify the ultrasonic examination (UT) techniques and personnel for examination of in-core instrument (ICI) nozzle tubes at Waterford Steam Electric Station, Unit 3 (Waterford 3), in accordance with the requirements of 10 CFR 50.55a(g)(6)(ii)(D)(4), the required surface examination of the ICI nozzle tube to the extent specified by Code Case N-729-1, as required and conditioned by 10 CFR 50.55a(g)(6)(ii)(D)(3), would result in a hardship without a compensating increase in the level of quality and safety.

Due to the immediate need of this relief for alternative request, verbal authorization for the use of the request was granted on November 4, 2009, for Waterford 3.

## 2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(g)(6)(ii)(D) require augmented inservice inspection (ISI) of reactor pressure vessel head (RPVH) penetration nozzles of pressurized-water reactors (PWRs) in accordance with ASME Code Case N-729-1, subject to the conditions specified in paragraphs (2) through (6) of 10 CFR 50.55a(g)(6)(ii)(D). Paragraph (3) states, in part, that "Instead of the specified 'examination method' requirements for volumetric and surface examinations in Note 6 of Table 1 of Code Case N-729-1, the licensee shall perform volumetric

and/or surface examination of essentially 100 percent of the required volume or equivalent surfaces of the nozzle tube, as identified by Figure 2 of ASME Code Case N-729-1."

The regulations in 10 CFR 50.55a(a)(3) state, in part, that alternatives to the requirements of 10 CFR 50.55a(g) may be used when authorized by the NRC, if the applicant demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The request for authorization to use the proposed alternative to define an alternative examination surface for each nozzle has been submitted on the basis that compliance with the specified requirements would result in hardship due to significant personnel radiation exposure without a compensating increase in the level of quality and safety.

The Code of record for Waterford 3 for the third 10-year ISI interval is the 2001 Edition through 2003 Addenda of Section XI of the ASME Code. The licensee requests relief for refueling outage 16 in the fall of 2009, up to refueling outage 17 in the spring of 2011 when the RPVH will be replaced.

## 3.0 TECHNICAL EVALUATION

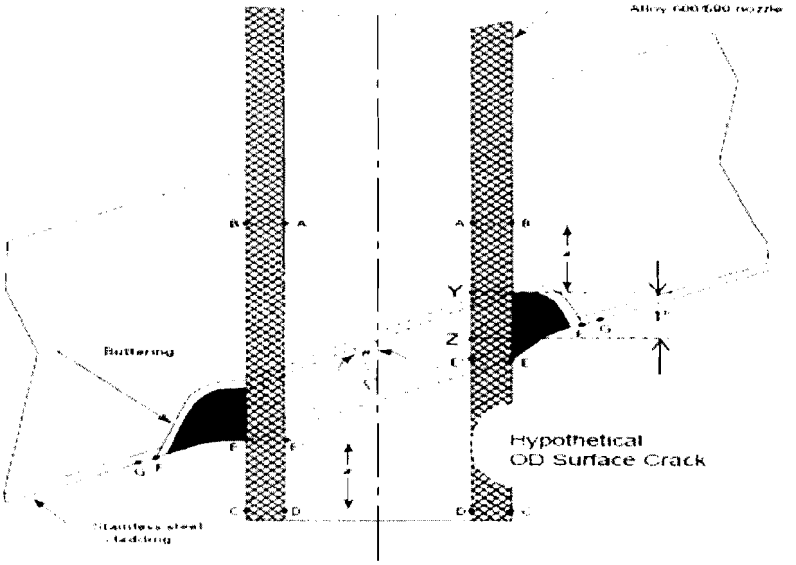
### 3.1 Components Affected

The components affected are 10 ASME Code Class 1 RPVH penetration ICI nozzles, 02-T-92 through 02-T-101, identified by item number B4.20 in Table 1 of ASME Code Case N-729-1.

### 3.2 Code Requirements

The regulations in 10 CFR 50.55a(g)(6)(ii)(D)(1) state, in part, that licensees of existing

FIG. 2 EXAMINATION VOLUME FOR NOZZLE BASE METAL AND EXAMINATION AREA FOR WELD AND NOZZLE BASE METAL




operating PWRs shall augment their ISI program with ASME Code Case N-729-1, subject to the

*Source: Case N-729-1, Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds. March 28, 2006. American Society of Mechanical Engineers.*

conditions specified in paragraphs (g)(6)(ii)(D)(2) through (6). The licensee is to perform a volumetric and/or surface examination of essentially 100 percent of the required volume or equivalent surfaces of the nozzle tube, as identified by Fig. 2 (shown below) of ASME Code Case N-729-1.

Fig. 2 of ASME Code Case N-729-1 identifies the required volume of tube to be inspected as a distance "a" above the highest point of the root (Y) of the J-groove weld to a distance "a" below the lowest point of the toe (E) of the J-groove weld. The distance "a" is equal to 1.5 inches (38 millimeters or mm) for incidence angle, $\Theta$, $\leq$ 30 degrees and for all nozzles $\geq$ 4.5 inches (115 mm) outside diameter (OD) or 1 inches (25 mm) for incidence angle, $\Theta$, $\geq$ 30 degrees; or to the end of the tube, whichever is less. Since the ICI nozzle tubes have an OD of 5.563 inches, the required distance "a" is 1.5 inches. If a surface examination is being substituted for a volumetric examination on a portion of a penetrating nozzle that is below the toe of the J-groove weld, the surface examination shall be of the inside and outside wetted surface of the penetration nozzle not examined volumetrically (A-D-C-E).

3.3 Licensee's Proposed Alternative and Basis

In its letter dated October 19, 2009, the licensee stated that it was unable to qualify the UT examination personnel and procedures for the ICI nozzles in accordance with the requirements of 10 CFR 50.55a(g)(6)(ii)(D)(4), in time to support the Waterford 3 fall 2009 refueling outage. As an alternative to UT examination, 10 CFR 50.55a(g)(6)(ii)(D)(3) allows substitution of surface examination of the nozzle inside diameter (ID) and OD wetted surfaces. The licensee stated that the ID surface examination can be performed remotely but, due to nozzle geometry, the OD surface examination would have to be performed manually. In its letter dated October 19, 2009, the licensee also states that manually performing an OD surface examination would constitute a hardship due to significant personnel radiation exposure, estimated to be between 1- and 3-person roentgen equivalent man (rem).

Referring to Fig. 2, the licensee proposes to perform an eddy current (ET) examination of the ID (A-D) and bottom surfaces (C-D) of the nozzle tube. The ET examination will extend from a distance "a" above the highest point of the J-groove weld root (Y) to the extent possible below the J-groove weld, and include the bottom surface of the penetration nozzle tube. Instead of the ET examination of the nozzle tube OD surface (C-E), the licensee proposes to perform a volumetric examination of the nozzle tube on the ID from 1.5 inches above the J-groove weld root to detectable extent of the nozzle tube below the J-groove weld (A-D) and on the lower end surface (C-D) using time of flight diffraction (TOFD) UT examination. Where the UT data quality between the J-groove weld root to one inch below the J-groove weld root (Y-Z) is determined to be unacceptable, a compensatory ET examination of the ICI nozzle tube outside diameter (OD) surface (C-E) will be performed.

In its letter dated October 19, 2009, the licensee states that a finite element analysis of the operating and weld residual stresses, and a fracture mechanics evaluation of crack growth have been performed to show that a postulated through-wall crack with its tip 1 inch below the J-groove weld root will not propagate to the root within one operating cycle.

In its letter dated November 2, 2009, the licensee states that the combination of the ET examination of the nozzle ID and bottom end surfaces, along with TOFD UT examination from

the nozzle ID and bottom end surface and the flaw growth evaluation demonstrates that sufficient length exists so that a hypothetical axial crack located at least one inch below the root of the J-groove weld will not reach the root of the J-groove weld within one operating cycle, thus assuring the integrity of the pressure boundary until the RPVH is replaced during the next refueling outage.

## 4.0 NRC STAFF EVALUATION

The susceptibility of RPVH penetration nozzles in PWRs to primary water stress-corrosion cracking (PWSCC) is a safety concern. The nozzles are nickel-based alloys and are welded using nickel-based weld metal alloy to the RPVH. Primary water coolant, high tensile stress, and elevated operating temperatures of PWRs can result in PWSCC of the nickel-based alloys used in the ICI nozzle tubes. The subject ICI nozzle tubes at Waterford 3 meet the conditions for PWSCC and, therefore, may be susceptible to cracking in the nozzle tubes and associated welds which could result in leakage of boric acid and corrosion of the low-alloy steel RPVH.

The licensee has identified physical limitations which prevent qualification of volumetric inspections of the ICI nozzles below the J-groove weld. These limitations include an elliptical cross-section that results from lower end of the tube conforming to the spherical head surface. The tube distortion can make it impossible to maintain adequate contact of the UT transducers with the tube ID, resulting in the inability to qualify and perform the UT examination. The NRC staff notes that other licensees have also been unable to qualify UT examination of the ICI tubes to the requirements of 10 CFR 50.55a(g)(6)(ii)(D)(4) and is satisfied that qualification cannot be accomplished at this time.

The regulations in 10 CFR 50.55a(g)(6)(ii)(D)(3) states the licensee has the option of performing a surface examination of the wetted surface of the penetration nozzle not examined volumetrically. The nozzle tube ID and lower end surface inspections can be performed remotely using ET equipment, but the dimensional variations in the nozzles that result from tolerances in allowable J-groove weld reinforcement during original fabrication and the elliptical cross-section that results from lower end of the tube conforming to the spherical head surface, makes manual surface examination of the nozzle OD necessary. In its letter dated October 19, 2009, the licensee estimated that manual examination of the OD surfaces would result in a high radiation exposure to the workers, approximately 1-to-3 person-rem for ET examination of all ICI locations. The NRC staff notes that other licensees are also unable to remotely perform ET examination of ICI nozzle tube OD, and concludes that remote ET examination cannot be performed at this time. The NRC staff concludes that compliance with the surface coverage requirements of 10 CFR 50.55a(g)(6)(ii)(D)(3) would result in a hardship as the result of exposure of personnel to a significant radiation dose.

As an alternative to the Code-required examination, the licensee has proposed to use ET to examine the ICI nozzle tubes from the required distance "a," per Code Case N-729-1, above the highest point of the root of the J-groove weld to the maximum extent possible below the J-groove weld, including the bottom-end surface of the nozzle. However, instead of performing an ET examination of the nozzle tube OD below the J-groove weld toe, the licensee proposes to perform a supplemental UT examination from the nozzle tube ID and bottom tube surface using personnel and procedures which were Electric Power Research Institute (EPRI)-qualified to perform UT examinations on control element drive mechanism nozzles. The extent of this UT

examination is from a distance "a" above the root of the J-groove weld to the extent possible below the J-groove weld toe. The NRC staff notes that such an UT examination has been used to satisfy the requirements of the First Revised NRC Order EA-03-009 (Order) (Reference 3).

The licensee has recognized that the physical limitations which prevented the UT procedure and personnel from being qualified for ICI nozzles will also be present during the UT examination of the nozzle tube, and may result in areas where the quality of the TOFD data is unacceptable. If EPRI-qualified analysts determine that the TOFD data has unacceptable quality from the root of the J-groove weld to 1 inch below the root of the J-groove weld (Y-Z), the licensee proposes to perform a manually delivered ET examination of the ICI penetration tube OD surface (C-E). The NRC staff notes that where this OD surface examination is performed in combination with the ET examination of the nozzle tube ID and end face, the extent of examination required by 10 CFR 50.55a(g)(6)(ii)(D) has been achieved for that nozzle tube.

In response to a request for additional information concerning the expected extent of UT coverage, the licensee provided data of the extent of UT examination coverage from refueling outage 15 in 2008 (Reference 1). These data showed that UT examination extent was obtained down to at least the toe of the J-groove weld in all cases, and was in excess of 2 inches below the root in over 90 percent of the measurements. The staff has reviewed these data and finds that the UT examination will capture the critical areas of the ICI nozzle tubes and will be carried out to the extent possible.

The licensee has conducted an analysis of the stresses in the nozzle and expected propagation of a postulated axial through-wall crack below the J-groove weld (Reference 4). The first part of the analysis consisted of a three-dimensional elastic-plastic finite element stress analysis to evaluate the axial and hoop stresses in the head penetration region. This analysis considered the pressure loads associated with steady state operation, as well as the stresses that result from the fabrication process. The second part of the analysis consisted of an fracture mechanics evaluation of the propagation distance of various hypothetical axial through-wall crack configurations. The crack growth formula and the associated numerical constants used by the licensee are the same as those given in ASME Code, Section XI, Appendix O, 2004 Edition for reactor vessel head penetration nozzles[1]. Therefore, the NRC staff concludes the use of the formula and numerical constants to determine crack growth are acceptable.

The NRC staff notes that the licensee did not evaluate propagation of hypothetical circumferential cracks in its flaw growth analysis. However, the staff agrees with the licensee's conclusion that circumferentially oriented PWSCC cracking below the J-groove weld does not pose a concern to leak integrity since circumferential cracks are not projected to grow in the direction of the J-groove weld. Furthermore, PWSCC circumferential cracking originating at the OD surface above the J-groove weld does not occur in the absence of primary water and presence of primary-water leakage to this region will be examined with the required bare metal visual inspection of the head and a qualified weld leak path assessment. Circumferential cracking originating at the ID surface will be detected with the ET examination of the ID surface

[1] Two values of the crack growth exponent, $\beta$, were given in Reference 4, one of which was 1.16, corresponding with the value given in ASME Code, Section XI, Appendix O. The other value in Reference 4 was somewhat larger and would give a more conservative result. Thus the $\beta = 1.16$ value is bounding.

and will be dispositioned accordingly. Therefore, the staff accepts the crack propagation evaluation without further consideration of circumferential crack propagation.

The NRC staff notes that axial through-wall cracks and axial ID surface cracks do not need to be considered further in the flaw growth analysis since the ASME Code-compliant ET examination of the ID surface (A-D) will ensure that no surface penetrating cracks exceeding Code limits exist on the ID surface. Also, OD surface cracks above the J-groove weld do not need to be considered because they cannot be initiated in the absence of primary water, and the existence of primary water in the OD region above the J-groove weld is evaluated by the required bare metal visual inspection of the head and the qualified weld leak path assessment.

The bounding condition for a hypothetical axial crack that is not examined by an ASME Code-compliant technique and could exist in contact with primary water is a surface crack on the nozzle tube OD below the J-groove weld whose crack depth (a) approaches the wall thickness (t) at time of ET examination ID inspection (i.e., the value of a/t approaches one). The uppermost extent that such a hypothetical crack on the nozzle tube could exist is determined by the supplemental TOFD UT examination from the ID surface. The licensee's requirement of a minimum of 1 inch of acceptable UT data below the J-groove weld root ensures that a crack cannot exist in this inspected volume. The NRC staff notes that although the UT examination is not compliant with the qualification requirements of 10 CFR 50.55a(g)(6)(ii)(D)(4), the operators and procedures have been qualified for control element drive mechanism nozzle tube examinations, and UT examination has been accepted for ICI nozzle examination under the Order. Therefore, the staff concludes that the examination provides reasonable assurance that an OD surface flaw does not exist within the specified 1-inch distance to the J-groove weld root.

After a small increment in operating time, such an OD surface crack could become a through-wall crack and begin to propagate in the axial direction. The licensee has analyzed the time required for a through-wall crack whose upper tip is located 1 inch below the root of the J-groove weld (Z) to propagate to the root (Y) of the J-groove weld. The NRC staff has evaluated the licensee's fracture mechanics crack growth data for this condition (Reference 4, Figures 6-10A and 6-11A) and determined that the minimum time for such a through-wall crack to propagate to the root of the J-groove weld is in excess of 2.6 years, a time period greater than that of one operating cycle. The NRC staff, therefore, concludes that there is sufficient margin to ensure pressure boundary integrity of the ICI nozzles for one cycle of operation.

The NRC staff notes that there are several areas of conservatism in the conclusion of sufficient margin. First, the licensee's analysis assumes the worst-case condition, an OD surface flaw just before it becomes through-wall, and ignores the time that the OD flaw would require to propagate in depth to become a through-wall crack. In addition, although the licensee has specified that the UT data needs to have acceptable quality only to 1 inch below the weld root, the data from refueling outage 15 (Reference 1) shows that UT examination extends to at least the weld toe in all cases and significantly extends beyond the J-groove weld toe in most cases. Also, the UT examination from the bottom nozzle tube surface (C-D) will perform a second volumetric examination of the nozzle tube below the J-groove weld, ensuring that cracks do not exist in this volume. Therefore, the NRC staff concludes the licensee's examination coverage provides reasonable assurance of structural integrity and leak tightness of the ICI nozzles for one refueling cycle.

ASME Code Case N-729-1, on which the examination requirements are based, allows justification of an alternative examination zone when it can be demonstrated using the methodology in Appendix I of the Code Case, that a hypothetical axial crack in the unexamined zone below the J-groove weld will not grow to the toe of the J-groove weld prior to the next examination[2]. For continuing long-term operation of the RPVH over several operating cycles, the possibility of corrosion of the steel RPVH must be avoided. Therefore, setting the acceptance criterion of propagation to the toe of the J-groove weld is reasonable and conservative. The NRC staff has considered the present acceptance criterion, that a hypothetical crack below the J-groove weld not be allowed to grow to the root, rather than to the toe, of the J-groove weld. The staff concludes that, when the RPVH will be replaced during the next refueling outage, as is the case for Waterford 3, an appropriate acceptance criterion is to ensure the integrity of the pressure boundary for that one cycle. Therefore, the staff concludes that crack propagation to the root of the J-groove weld is an appropriate evaluation criterion and is, therefore, acceptable.

Finally, the NRC staff notes that examinations of the Waterford 3 ICI nozzle tubes since the issuance of the Order have not found any indication of PWSCC, an indication that the material from which the nozzle tubes are fabricated and the fabrication conditions employed make the Waterford 3 ICI nozzle tubes less susceptible to PWSCC than those of some other plants.

## 5.0 CONCLUSION

Based on the above, the NRC staff has reviewed the licensee's request and determined that the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the subject ICI nozzles, and that complying with the requirements of Code Case N-729-1, as required and conditioned by 10 CFR 50.55a(g)(6)(ii)(D), would result in a hardship due to significant personnel radiological exposure without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the use of the proposed alternative for the third 10-year ISI interval at Waterford 3, for the 16th operating cycle, beginning in fall of 2009, up to the commencement of the 17th refueling outage in spring of 2011 when the RPVH is replaced. Due to the immediate need of this relief request, verbal authorization for the use of the request was granted on November 4, 2009, for Waterford 3 (Reference 5).

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

## 6.0 REFERENCES

1. Murillo, R., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Response to NRC Request for Additional Information for Alternative W3-ISI-015, Inspection of Reactor Pressure Vessel Head In-Core Instrument Nozzles during Third Ten-Year Inservice Inspection Interval," dated November 2, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML093080127).

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[2] Paragraph 6 of 10 CFR 50.55a(g)(6)(ii)(D) does not allow the use of Appendix I of Code Case N-729-1 to determine an alternate examination zone without prior NRC approval.

2. Murillo, R., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Request for Alternative W3-ISI-015, Inspection of Reactor Vessel Head In-Core Instrument Nozzles During Third Ten-Year Inservice Inspection Interval," dated October 19, 2009 (ADAMS Accession No. ML092940241).

3. Borchardt, R.W., U.S. Nuclear Regulatory Commission, letter and Enclosure to All Holders of Licenses for Operating Pressurized Water Reactors as listed in Attachment to the Enclosed Order, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements For Reactor Pressure Vessel Heads At Pressurized Water Reactors," dated February 20, 2004 (ADAMS Accession No. ML040220181).

4. Westinghouse Electric Company, LLC, "Structural Integrity Evaluation of Reactor Vessel Upper Head Penetrations to Support Continued Operation: Waterford Unit 3 and ANO Unit 2," WCAP-15815-P, Revision 1, March 2002 (Not publicly available; proprietary information). Enclosure to R. Murillo, Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission dated November 4, 2009 (ADAMS Accession No. ML093080342).

5. Kalyanam, K., U.S. Nuclear Regulatory Commission, e-mail to R. Murillo and J. Pollock, Entergy Operations, Inc., "Verbal Authorization of Request for Alternative – W3-ISI-015," dated November 4, 2009 (ADAMS Accession No. ML093160442).

Principal Contributor: J. Wallace

Date: July 6, 2010

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's request and determined that the inspection of the nozzle to the extent required by Code Case N-729-1 would result in a hardship due to significant personnel radiological exposure without a compensating increase in the level of quality or safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the use of the proposed alternative for the third 10-year ISI interval at Waterford 3, for the 16th operating cycle, beginning in fall of 2009, up to the commencement of the 17th refueling outage in spring of 2011 when the reactor pressure vessel head is replaced. Due to the immediate need of this relief for alternative request, verbal authorization for the use of the request was granted on November 4, 2009, for Waterford 3.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

The staff's safety evaluation is enclosed.

Sincerely,

/RA/

Michael T. Markley, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure:
Safety Evaluation

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