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

January 13, 2011

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 NRC ALTERNATIVE TO ASME IWA-5211 REGARDING CHEMICAL VOLUME CONTROL SYSTEM PIPE VISUAL INSPECTION (TAC NO. ME3419)

Dear Sir/Madam:

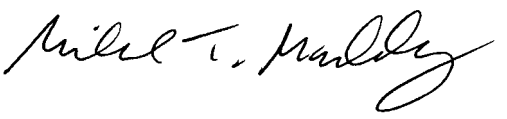
By letter dated February 22, 2010, as supplemented by letter dated September 15, 2010, Entergy Operations, Inc. (Entergy, the licensee), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), submitted Request for Alternative W3F1-2010-0018 for Waterford Steam Electric Station, Unit 3 (Waterford 3). Entergy requested U.S. Nuclear Regulatory Commission (NRC) approval to use an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, to perform VT-2 visual examination pertaining to portions of two Chemical Volume Control System lines that are enclosed in a vertical pipe chase. Entergy proposes to perform the VT-2 visual examination during an outage with no pressure or temperature requirements. Entergy stated that the proposed alternative provides an acceptable level of quality and safety.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that complying with the requirement of performing a VT-2 visual examination during system leakage tests of the 2CH2-60 A/B and 2CH2-53 A/B lines enclosed in a vertical pipe chase would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. In addition, the NRC staff concludes that the licensee's proposed alternative provides reasonable assurance of structural integrity for the piping segments inside the vertical pipe chase. Therefore, while the licensee has requested the approval to use the alternative, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff is authorizing the Request for Alternative W3-ISI-017, pursuant to 10 CFR 50.55a(a)(3)(ii), for Waterford 3 for the third 10-year ISI interval, which began on May 31, 2008.

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 NRC staff's safety evaluation is enclosed. If you have any questions, please contact Kaly Kalyanam at (301) 415-1480 or via e-mail at kaly.kalyanam@nrc.gov.

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
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

REQUEST FOR ALTERNATIVE W3-ISI-017

WATERFORD STEAM ELECTRIC STATION, UNIT 3

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-382

1.0 INTRODUCTION

By letter dated February 22, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100550134), as supplemented by letter dated September 15, 2010 (ADAMS Accession No. ML102590139), Entergy Operations, Inc. (Entergy, the licensee), submitted a request for alternative, W3-ISI-017, for the third 10-year inservice inspection (ISI) interval for visual examination of portions of two Chemical Volume Control System (CVCS) lines that are enclosed in a vertical pipe chase at Waterford Steam Electric Station, Unit 3 (Waterford 3) during system leakage tests. The request for alternative pertains to performing the visual examination during an outage without subjecting the piping to test pressurization of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, required test pressure during performance of a system leakage test.

A letdown line and a charging line of the CVCS are located in a pipe chase that is part of a Controlled Ventilation Area System (CVAS) boundary which provides high-efficiency particulate filtration and iodine adsorption in the controlled ventilation area. The Waterford 3 Technical Specifications (TSs) provide the operability requirements for CVAS. The subject piping is inaccessible during normal operation without deliberate entry into a TS action statement requiring plant shutdown.

While Entergy requested the approval of the alternative, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), the U.S. Nuclear Regulatory Commission (NRC) staff has evaluated the licensee's request for alternative W3-ISI-017 pursuant 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the requirement of the Code of record would result in hardship without a compensating increase in the level of quality and safety.

2.0 REGULATORY REQUIREMENTS

The regulations in 10 CFR 50.55a(g) require that ISI of ASME Code Class 1, 2, and 3

components be performed in accordance with Section XI of the ASME Code and applicable addenda, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). According to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph 50.55a(g) may be used, when authorized by the NRC, if an applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that ISI of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The ISI Code of record for the third 10-year ISI interval for Waterford 3 is the 2001 Edition of the ASME Code, Section XI with 2003 Addenda. The Waterford 3 third 10-year ISI interval began on May 31, 2008.

3.0 TECHNICAL EVALUATION

3.1 System/Component(s) for Which Relief is Requested (as stated by the licensee)

Line 2CH2-60 A/B and Line 2CH2-53 A/B in the vertical pipe chase.

3.2 ASME Code Requirements (as stated by the licensee)

ASME [Code] Section XI, Table IWC-2500-1, Examination Category C-H, Item No[s]. C7.10 requires the subject lines to be VT-2 visually examined during a system leakage test each inspection period. IWA-5211 requires that the visual examination be performed while the item being tested is at normal operating pressure.

3.3 Licensee's Requested Alternative (as stated by the licensee)

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy requests authorization to perform a VT-2 visual examination of the subject lines and the surrounding areas once each period during a refueling outage with no pressure/temperature requirements. This alternative will be performed in lieu of the requirements of IWA-5211 for the subject lines inside the vertical pipe chase. This examination will be performed prior to any maintenance being performed inside the pipe chase or on the subject lines.

3.4 Licensee's Basis for Requesting Relief (as stated by the licensee)

ASME [Code] Section XI IWA-5213(a) requires that a non-insulated component be at system operating pressure for 10 minutes and a VT-2 visual examination performed while at pressure. IWA-5241(b) allows an examination of the surrounding area (including floor areas or equipment surfaces located underneath the components) for evidence of leakage for non-insulated components that are inaccessible for direct VT-2 visual examination. IWA-5245 allows the pressure to be lowered to a level corresponding to a temperature of 200 °F [degrees Fahrenheit] after the required hold time but prior to the VT-2 visual examination for systems that operate above 200 °F.

Therefore, the code allows a non-insulated, non-borated standby system to be VT-2 examined by inspecting surfaces below the piping after being at test pressure for 10 minutes. In addition, the Code allows owners to perform this VT-2 examination after the pressure has been reduced to a pressure corresponding to a temperature of 200 °F.

Letdown line 2CH2-60 A/B and charging line 2CH-53 A/B are located in a pipe chase (the vertical L-wall pipe chase) that is part of a Controlled Ventilation Area System (CVAS) boundary. Waterford 3 utilizes the CVAS to provide high efficiency particulate filtration and iodine adsorption in the controlled ventilation area. The system must exhaust air from the controlled ventilation area at a rate required to create and maintain a negative pressure below 0.25-inch water gage relative to the surrounding areas. CVAS is composed of two independent trains, each capable of creating and maintaining the 0.25-inch water gage negative pressure. (See further discussions of CVAS operation in Waterford 3 Final Safety Analysis Report Section 6.5.1)

The Waterford 3 Technical Specification (TS) 3/4.7.7 provides the OPERABILITY requirements for CVAS. TS Section 4.7.7.d.2 requires that each CVAS train be capable of maintaining a negative pressure of 0.25-inch water gage. In the event this condition cannot be met, TS requires the associated train to be declared INOPERABLE and restored to OPERABLE status within 7 days or the plant must be placed in HOT STANDBY within the next six hours and in COLD SHUTDOWN within the following 30 hours. With both trains INOPERABLE, TS requires entry into TS Limiting Condition for Operation (LCO) 3.0.3. LCO 3.0.3 requires the appropriate LCO to be met within one hour or the plant must be in HOT STANDBY within the next six hours, HOT SHUTDOWN with the following 6 hours, and COLD SHUTDOWN with the subsequent 24 hours.

Temporary access to the pipe chase is provided through special block-out sections consisting of multiple layers of solid concrete blocks. Except for the temporary access block-outs, the pipe chase is totally enclosed by reinforced concrete walls. The blocks are mortared in place. The block-out sections penetrate into the CVAS boundary. Removing the block wall during normal operation (Modes 1, 2, 3, or 4) violates the CVAS boundary, placing both CVAS

trains in INOPERABLE status in accordance with TS. Approximately six days are required to remove and re-install the block wall.

The subject piping is inaccessible during normal operation without deliberate entry into a TS action statement requiring plant shutdown. When the pipe is accessible during plant shutdown (Modes 5 and 6), the system cannot be operated to obtain the required test conditions. Therefore, Entergy proposes the alternative described in Section II [of the licensee's letter dated February 22, 2010]. Entergy believes the alternative provides an acceptable level of quality and safety based on the following:

1) If leakage from the subject sections of charging and letdown piping were to occur, it would show up as unidentified leakage in the reactor coolant system inventory balance. Operations personnel perform this balance at least once every 72 hours per TS Surveillance 4.4.5.2.1 in Modes 1, 2, 3, and 4. The TS limit for unidentified leakage is 1 gpm [gallon per minute] unidentified leakage. If the 1 gpm TS limit is exceeded, TS requires a plant shutdown if leakage is not restored below the limit within 4 hours. In addition, administrative procedural controls are in place that would require a leakage investigation and shutdown evaluation well before the TS 1 gpm limit was reached.

2) These two non-insulated sections of piping in the vertical pipe chase do not see leakage test conditions during Modes 5 and 6. However, they do experience significant service while at normal plant conditions during plant operation. Records research has shown that these two lines have been in service for more than 20,000 hours during the last ten year period.

3) The subject charging and letdown lines are part of the Chemical Volume Control System (CVCS). This system is borated for the purpose of controlling reactivity. The boric acid provides a chemical marker that leaves behind a white stain when very small amounts of leakage occur. As any postulated leakage would occur over a period of time, boric acid residue would build, allowing discovery of very small leaks.

4) The time at pressure since the last VT-2 visual examination is in excess of 20,000 hours, far greater than the Code-required 10 minute hold time. Since these lines are borated and non-insulated, sufficient time is available for boric acid to build up on the piping or adjacent surfaces. A subsequent VT-2 visual examination, after the block wall has been removed and prior to any maintenance activities, is adequate to discover any leakage.

4.0 NRC STAFF EVALUATION

The ASME Code of record requires a VT-2 visual examination during a system leakage test each inspection period for the subject piping. The subject piping is inaccessible during normal operation without deliberate entry into a TS action statement requiring plant shutdown. When the pipe is accessible during plant shutdown (Modes 5 and 6), the system cannot be operated to obtain the required test conditions. In lieu of the requirements of ASME Code, Section XI, IWA-5211 for the subject lines inside the vertical pipe chase, the licensee proposes to perform a VT-2 visual examination of lines and the surrounding areas once each period during a refueling outage with no pressure or temperature requirements. This examination will be performed prior to any maintenance being performed inside the pipe chase or on the subject lines. The charging and letdown lines are part of the CVCS and the system is borated for the purpose of controlling reactivity. The direct visual examination during an outage will allow the licensee to detect minor leakage by the presence of boric acid crystals or residue.

The time at pressure for the subject piping since the last VT-2 visual examination is in excess of 20,000 hours, which is far greater than the Code-required 10-minute hold time. As such, the subject lines are in service for long periods of time between outages and many factors of time larger than the Code-required 10-minute hold time. These long periods of time, in addition to the system being borated, would provide positive indication of leakage regardless of system pressure.

The normal operating pressure for the subject piping during Modes 5 and 6 is elevation head, since the system is normally secured during these Modes. Waterford 3 was granted relief by the NRC in the previous inspection interval for this alternative examination in a letter dated May 30, 2002 (ADAMS Accession No. ML021500382). The inspection criteria applied then for the subject piping was to identify any boric acid residue rather than inspection for leakage. The NRC staff concludes that performing the proposed alternative will provide a better indication of the condition of the lines than the minimum Code requirement.

Additionally, the licensee states that the proposed alternative in lieu of the Code-required test pressure is based on the fact that there is no known degradation mechanism, such as intergranular stress-corrosion cracking, primary water stress-corrosion cracking, or thermal fatigue that is likely to affect the welds in the subject segment. The NRC staff concludes that the licensee's proposed alternative will provide reasonable assurance of structural integrity for the piping segments inside the vertical pipe chase.

While Entergy stated that the proposed alternative provides an acceptable level of quality and safety and requested the approval to use the alternative, pursuant to 10 CFR 50.55a(a)(3)(i), based on the above, the NRC staff concludes that complying with the specified requirement would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety and the licensee's proposed alternative will provide reasonable assurance of structural integrity for the piping segments inside the vertical pipe chase, pursuant to 10 CFR 50.55a(a)(3)(ii), for Waterford 3.

5.0 REGULATORY COMMITMENTS

In its letter dated February 22, 2010, the licensee made the following regulatory commitment:

Commitment	One-time Action	Scheduled Completion Date
Following NRC approval, Entergy will incorporate the alternative into the Waterford 3 Inservice Inspection Plan. This incorporation will also ensure the examination will be performed prior to any maintenance being performed inside the pipe chase or on the subject lines.	X	Prior to testing during the 2011 Refuel 17 Outage

The NRC staff concludes that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the regulatory commitments are best provided by the licensee's administrative processes, including its commitment management program. The regulatory commitments do not warrant the creation of regulatory requirements (items requiring prior NRC approval of subsequent changes).

6.0 CONCLUSION

Based on the above evaluation, the NRC staff concludes that complying with the requirement of performing a VT-2 visual examination during system leakage tests of the 2CH2-60 A/B and 2CH2-53 A/B lines enclosed in a vertical pipe chase would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. In addition, the NRC staff concludes that the licensee's proposed alternative provides reasonable assurance of structural integrity for the piping segments inside the vertical pipe chase. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the proposed alternative in Request for Alternative W3-ISI-017 is authorized for Waterford 3 for the third 10-year ISI interval, which began on May 31, 2008.

All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: P. Patnaik

Date: January 13, 2011

The NRC staff's safety evaluation is enclosed. If you have any questions, please contact Kaly Kalyanam at (301) 415-1480 or via e-mail at kaly.kalyanam@nrc.gov.

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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ADAMS Accession No. ML103570392 *SE memo date with minor changes

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DATE	1/10/11	1/10/11	12/21/10	1/13/11

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