



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

November 23, 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 – CORRECTION TO THE
MAY 18, 2010, SAFETY EVALUATION FOR RELIEF REQUEST
NO. W3-CISI-001 REGARDING POST-REPAIR LEAKAGE INSPECTION OF
STEEL CONTAINMENT VESSEL (TAC NO. ME3345)

Dear Sir or Madam:

By letter dated February 9, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100470056), Entergy Operations, Inc. (Entergy, the licensee), submitted request for relief No. W3-CISI-001, for Waterford Steam Electric Station, Unit 3 (Waterford 3), related to the post-repair leakage inspection of the Waterford 3 steel containment vessel. The licensee's proposed alternative test method for containment leak testing is in lieu of a Type A integrated leak rate test as required by American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, IWE-5221, "Leakage Test." The proposed alternative is applicable to Waterford 3's third 10-year inservice inspection (ISI) interval which began on May 31, 2008.

By letter dated May 18, 2010 (ADAMS Accession No. ML100850089), the U.S. Nuclear Regulatory Commission staff, pursuant to paragraph 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations*, authorized the proposed one-time alternative for the third 10-year ISI interval during the Waterford 3 Cycle 17 refueling outage, when the SGs are planned to be replaced.

By electronic mail dated September 23, 2010 (ADAMS Accession No. ML103000121), Mr. Steve Bennett of your staff informed the NRC staff of certain errors on pages 5 and 6 of the safety evaluation (SE) dated May 18, 2010. The errors relate to the incorrect description of the steel containment vessel hatch opening, testing method, and test pressure. Specific changes are outlined below.

Changes to SE Section 3.6, NRC Staff Evaluation

Currently, the May 18, 2010, SE Section 3.6 states, in part, that:

Two openings will be cut in the SCV in order to remove and replace the SGs. The SCV sections removed will be reattached by welding after the SG replacement....

... The sections of the SCV that were removed will be re-welded in place in accordance with the 2001 Edition through 2003 Addenda, Entergy's Code of

record requirements. Magnetic particle testing of the back gouge of the root pass area, along with 100 percent radiography of the final repair weld, will be performed. In addition, a general visual and a VT-3 examination of the SCV pressure boundary welds will be conducted. To perform a weld leak test, the containment will be pressurized to a test pressure Pa (of at least 15 psig) and held for a minimum of 10 minutes. A bubble test of the repair weld and a VT-2 visual inspection will then be performed with the pressure held at or above 15 psig.... All personnel performing the testing will meet the requirements of "Qualification and Certification of Nondestructive Testing Personnel," as recommended in SNT-TC-1A 2001 or ANSI/ASNT CP-189.

The magnetic particle testing and the 100 percent radiography of the repair weld, followed by the bubble test, will provide adequate assurance that the repair welds do not leak or have any structural defects....

Revised SE Section 3.6 will state:

A preexisting construction hatch opening ~~Two openings~~ will be cut in the SCV in order to remove and replace the SGs. The SCV construction hatch ~~sections removed~~ will be reattached by welding after the SG replacement....

...The **SCV construction hatch that was** ~~sections of the SCV that were~~ removed will be re-welded in place in accordance with the 2001 Edition through 2003 Addenda, ~~Entergy's Code of record requirements.~~ **Magnetic particle or liquid penetrant testing of the weld preparation** ~~testing of the back gouge of the root pass~~ area, along with 100 percent radiography of the final repair weld, will be performed. In addition, a general visual and a VT-3 examination of the SCV pressure boundary welds will be conducted. To perform a weld leak test, the containment will be pressurized to a test pressure Pa (of at least ~~44~~ **44 45** psig) and held for a minimum of 10 minutes. A bubble test of the repair weld and a VT-2 visual inspection will then be performed with the pressure held at or above **44 45** psig.... All personnel performing the testing will meet the requirements of "Qualification and Certification of Nondestructive Testing Personnel," as recommended in ~~SNT-TC-1A-2001~~ or ANSI/ASNT CP-189.

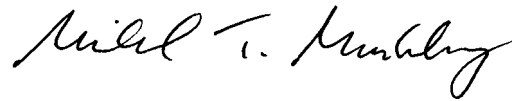
The magnetic particle **or liquid penetrant testing of the weld preparation area** ~~testing~~ and the 100 percent radiography of the repair weld, followed by the bubble test, will provide adequate assurance that the repair welds do not leak or have any structural defects....

Enclosed are corrected SE pages 5 and 6 with revision bars in the right margin indicating the areas of change. These errors did not impact Relief Request W3-CISI-001 and do not change the NRC staff's conclusions regarding this relief request for Waterford 3.

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The NRC regrets any inconvenience that this may have caused. If you have any questions regarding this matter, please contact me at (301) 415-1480.

Sincerely,

A handwritten signature in black ink that reads "Michael T. Markley". The signature is written in a cursive style with a large, prominent "M" and "T".

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

Docket No. 50-382

Enclosure:
Corrected SE pages 5 and 6

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ENCLOSURE

REVISED PAGES 5 AND 6 FROM
NUCLEAR REGULATORY COMMISSION SAFETY
EVALUATION DATED MAY 18, 2010
RELATED TO RELIEF REQUEST W3-CISI-001 FOR
WATERFORD STEAM ELECTRIC STATION, UNIT 3

there is zero leakage around the weld. This acceptance criterion is a more stringent criterion than that of a Type A test. Pressurization to greater than or equal to design pressure will assure the structural integrity of the SCV. Therefore, if there is any leakage of the SCV at the repair weld, it would be identified by the bubble test, and corrected.

The ILRT requires additional scheduled time, manpower, dose, and test instrumentation to be installed throughout containment. The ILRT takes longer to perform and virtually stops other work from taking place inside of containment for an extended period. In addition, the ILRT provides less assurance of the quality of the repair weld of the containment vessel since it could allow some leakage through the repair weld. Therefore, a localized leak test provides a more accurate and direct method of assuring the leak tight integrity of the repair weld. The localized leak bubble test is considered a superior test for determining leakage at the repaired area as compared to a Type A test.

The proposed localized leakage test for the SCV hatch repair is also consistent with Section 9.2.4, "Containment Repairs and Modifications," of [Nuclear Energy Institute] NEI 94-01, Revision 2 ... which states:

Repairs and modifications that affect the containment leakage integrity require local leakage rate testing or short duration structural tests as appropriate to provide assurance of containment integrity following the modification or repair. This testing shall be performed prior to returning the containment to operation.

The combination of a full radiography (meeting the construction code radiography acceptance criteria) and the localized leak test of the repair weld (while at design pressure) will confirm the integrity of the steel containment vessel. In accordance with the requirements of 10CFR50.55a (a)(3)(i), Entergy believes that the localized leak test provides an acceptable level of quality and safety in lieu of the ASME Code required test.

3.6 NRC Staff Evaluation

To facilitate the Waterford 3 SG replacement, the free-standing SCV of Waterford 3 will be breached. A pre-existing construction hatch opening will be cut in the SCV in order to remove and replace the SGs. The SCV construction hatch will be reattached by welding after the SG replacement. The ASME Code, Section XI, Paragraph IWE-5221, requires that leakage rate testing be conducted to ensure the integrity of the repairs prior to returning the SCV to operable status. In lieu of the Type A, Type B, or Type C leakage rate testing, the licensee has proposed to perform a series of examinations and a leak test, subjecting the SCV to accident pressure, to verify the leak tightness and integrity of the liner welds and the SCV.

The detailed examination and test sequence are included in the licensee's proposed relief request and summarized herein. The licensee has proposed to perform the activities described below as a part of the SCV restoration effort. The SCV construction hatch that was removed will be re-welded in place in accordance with the 2001 Edition through 2003 Addenda. Magnetic particle or liquid penetrant testing of the weld preparation area, along with 100 percent radiography of the final repair weld, will be performed. In addition, a general visual and a VT-3 examination of the SCV pressure boundary welds will be conducted. To perform a weld leak test, the containment will be pressurized to a test pressure Pa (of at least 44 psig) and held for a minimum of 10 minutes. A bubble test of the repair weld and a VT-2 visual inspection will then be performed with the pressure held at or above 44 psig. A zero leakage criteria will be used for weld acceptance, which is determined by the absence of any bubbles. All personnel performing the testing will meet the requirements of "Qualification and Certification of Nondestructive Testing Personnel," as recommended in ANSI/ASNT CP-189.

The magnetic or liquid penetrant testing of the weld preparation area testing and the 100 percent radiography of the repair weld, followed by the bubble test, will provide adequate assurance that the repair welds do not leak or have any structural defects. The zero leakage acceptance criteria for the bubble test will ensure that the SCV leakage rate is not altered by the SG replacement activity and the pressurization of the SCV to the accident pressure will confirm the integrity of the SCV after the repair. Therefore, the NRC staff concludes that the proposed alternative will provide adequate assurance of structural integrity.

4.0 REGULATORY COMMITMENT

In its letter dated February 9, 2010, the licensee made the following commitment:

Entergy will conduct a localized leakage bubble test in accordance with Alternative W3-CISI-001 on the restoration of the Waterford 3 steel containment vessel construction hatch (in lieu of a Type A integrated leak rate test as required ASME IWE-5221).

The proposed commitment satisfies the need for one-time action compliance, prior to MODE 4, coming out of the Waterford 3 refueling outage 17. The NRC staff considers the proposed commitment to be a regulatory commitment and concludes it is acceptable.

5.0 CONCLUSION

On the basis of the above, the NRC staff has determined that the proposed alternative tests provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the use of the proposed one-time alternative for the third 10-year ISI interval during the Waterford 3 Cycle 17 refueling outage, when the SGs are planned to be replaced.

The NRC regrets any inconvenience that this may have caused. If you have any questions regarding this matter, please contact me at (301) 415-1480.

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:
Corrected SE pages 5 and 6

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