



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

February 20, 2013

Vice President, Operations  
Entergy Operations, Inc.  
River Bend Station  
5485 US Highway 61N  
St. Francisville, LA 70775

SUBJECT: RIVER BEND STATION, UNIT 1 – RELIEF REQUEST NO. RBS-RR-2011-001,  
RELIEF FROM REQUIREMENTS OF ARTICLE IWA-4221(B) OF ASME CODE,  
SECTION XI (TAC NO. ME9622)

Dear Sir or Madam:

By letter dated September 20, 2012, as supplemented by letter dated October 26, 2012, Entergy Operations, Inc. (Entergy, the licensee), requested U.S. Nuclear Regulatory Commission (NRC) approval of relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) for installed Weir valves in the standby service water system (SSW) valves until they can be replaced at River Bend Station, Unit 1. The relief request is applicable to the third 10-year inservice inspection (ISI) interval, which ends in December 2017, after refueling outage (RF)-19.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(ii,) the licensee requested relief from Article IWA-4221(b) of ASME Code, Section XI, to permit the continued use of the Code Class 3 SSW valves which are not currently in compliance with the construction code.

The NRC staff has determined that the proposed alternative provides reasonable assurance of structural integrity or leak tightness of the subject components and that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii).

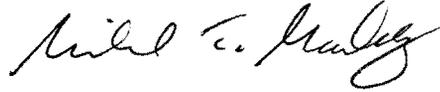
Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the proposed alternative for the River Bend Station, Unit 1. Entergy has made a regulatory commitment to replace the Division "2" SSW valves identified in this submittal during RF-18, currently scheduled for early 2015, and replace the Division "1" valves identified in this submittal during RF-19, currently scheduled for early 2017.

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

- 2 -

The NRC staff's safety evaluation is enclosed. If you have any questions, please contact me at 301-415-1445 or via e-mail at [Alan.Wang@nrc.gov](mailto:Alan.Wang@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Michael T. Markley". The signature is written in a cursive style with a large, sweeping initial "M".

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

Docket No. 50-458

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

RELIEF REQUEST NO. RBS-R&R-2011-001 FROM REQUIREMENTS

OF ASME CODE, SECTION XI, FOR DELAYED REPLACEMENT OF

STANDBY SERVICE WATER SYSTEM VALVES

ENTERGY OPERATIONS INC.

RIVER BEND STATION, UNIT 1

DOCKET NUMBER 50-458

1.0 INTRODUCTION

By letter dated September 20, 2012 (Agencywide Document Access and Management System (ADAMS) Accession No. ML12269A102), as supplemented by letter dated October 26, 2012 (ADAMS Accession No. ML12321A046), Entergy Operations, Inc. (Entergy, the licensee), requested U.S. Nuclear Regulatory Commission (NRC) approval of relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) for installed Weir valves in the standby service water system (SSW) valves until they can be replaced at River Bend Station, Unit 1 (RBS). The relief request is applicable to the third 10-year inservice inspection (ISI) interval, which ends in December 2017, after refueling outage (RF)-19.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(ii), the licensee requested relief from article IWA-4221(b) of Section XI of the ASME Code to permit the continued use of Code Class 3 SSW valves which are not currently in compliance with the ASME Code, Section III, Table ND-4622.7, the construction code for these SSW valves. The licensee has proposed replacement of the Division "2" SSW valves identified in this submittal during refueling outage (RF)-18, currently scheduled for early 2015, and replace the Division "1" valves identified in this submittal during RF-19, currently scheduled for early 2017. The basis for replacement on a delayed schedule rather than immediate replacement is that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.0 BACKGROUND

The original request for relief on this subject was submitted by the licensee by letter dated December 22, 2011 (ADAMS Accession No. ML12003A196). This original submittal was based on ASME Code Case N-804, "Alternative Preheat Temperature for Austenitic Welds in P-No. 1 Material without PWHT, Section III, Division 1." ASME Code Case N-804 has been approved

Enclosure

by the ASME, but is not accepted for use by the NRC. The licensee supplemented the original submittal on March 5, 2012 (ADAMS Accession No. ML12082A186), in the form of responses to NRC staff requests for additional information. In further discussions with Entergy, the NRC staff noted that it was still in the process of reviewing the Code Case N-804 and, therefore, the NRC staff did not feel it was appropriate to reference the Code Case at this time. The NRC staff did note that there appeared to be sufficient bases to request a relief without using the Code Case. As such, by letter dated June 8, 2012 (ADAM Accession No. ML12172A138), the licensee withdrew its request re-submitted it on September 20, 2012, without referencing Code Case N-804. The licensee supplemented the request (to clarify the regulatory basis for requesting relief) on October 26, 2012. The licensee revised its request for authorization of an alternative to the requirements of Table ND-4622.7 of Section III of the ASME Code from 10 CFR 50.55a(a)(3)(i) to 10 CFR 50.55a(a)(3)(ii). The NRC staff's evaluation of this request is based on all documents noted above.

### 3.0 REGULATORY EVALUATION

This request is for ASME Code Class 3 components. RBS received its construction permit in 1977.

The regulations in 10 CFR 50.55a(a)(3) state, in part, that alternatives to the requirements contained in paragraphs (c) through (h) of 10 CFR 50.55a may be used, when authorized by the NRC, if the licensee 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.

Section III of the ASME Code is discussed in paragraphs (b), (c), (d), and (e) of 10 CFR 50.55a. Paragraph (b) incorporates the ASME Code into regulation by reference. It does not specifically require the use of any portion of the Code and is not included within the paragraphs listed in 10 CFR 50.55a(a)(3) for which the NRC staff may authorize alternatives. Paragraph (c) addresses quality group A components (ASME Code Class 1 components). These components are not the subject of this request. Paragraph (d) addresses quality group B components (ASME Code Class 2 components). These components are not the subject of this request. Paragraph (e) addresses quality group C components (ASME Code Class 3 components) and requires that, for plants whose application for a construction permit is dated after May 14, 1984, components must meet the requirements for Code Class 3 components in Section III of the ASME Code. Based on the age of RBS, this paragraph does not apply.

Based on the above analysis, there is no direct requirement for quality group C components at RBS to meet ASME Code, Section III, Code Class 3 requirements. Given that there is no direct requirement for the component under consideration to meet ASME Code Class 3 requirements, the NRC staff possesses no direct regulatory authority to authorize an alternative to those requirements.

Alternatively, the licensee stated, and the NRC staff agrees, that the components under consideration are replacement components. As such, ASME Code, Section XI, Article IWA 4000, Repair/Replacement Activities, applies. ASME Code, Section XI,

Article IWA-4221(b) states, in part, that, "an item to be used for repair/replacement activities shall meet the Construction Code..." In this case, the applicable construction code item is the ASME Code, Section III, Table ND-4622.7. Due to the fact that the issue under consideration is one of repair/replacement, the NRC staff is evaluating this request as a request for relief from Article IWA-4221(b) of Section XI of the ASME Code.

Adherence to Article IWA-4221(b) of Section XI of the ASME Code is mandated by 10 CFR 50.55a(g)(4) which states, in part, that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) which are classified as ASME Code Class 1, 2, and 3 must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of editions and addenda of the ASME Boiler and Pressure Vessel Code.

Since 10 CFR 50.55a(g) is specified by the regulations in 10 CFR 50.55a(a)(3), the NRC staff has the authority to authorize alternatives to Article IWA-4221(b) of Section XI of the ASME Code.

#### 4.0 TECHNICAL EVALUATION

##### 4.1 Applicable Code Edition and Addenda

- ASME Boiler and Pressure Vessel Code, Section XI, 2001 Edition through 2003 Addenda
- ASME Boiler and Pressure Vessel Code, Section III, 1974 Edition / Summer 1975 Addenda (construction code)
- ASME Boiler and Pressure Vessel Code, Section III, 1992 Edition / No Addenda (repair/replacement code – later edition of construction code)

##### 4.2 Components for Which Relief is Requested

The valves are of various sizes. Division 1 valves are annotated with an "A" and Division 2 valves are annotated with a "B."

Component:

E12-MOVF068A, Residual Heat Removal Heat Exchanger Service Water Return

E12-MOVF068B, Residual Heat Removal Heat Exchanger Service Water Return

SWP-MOV506A, High Pressure Core Spray Diesel Generator Engine Water Heat Exchange Service Water Header Isolation

SWP-MOV506B, High Pressure Core Spray Diesel Generator Engine Water Heat Exchange Service Water Header Isolation

SWP-MOV501A, Reactor Closed Cooling Water Heat Exchanger Service Water Supply Header Isolation Valve

SWP-MOV501B, Reactor Closed Cooling Water Heat Exchanger Service Water Supply Header Isolation Valve

SWP-MOV511A, Normal Service Water Return Isolation

SWP-MOV511B, Normal Service Water Return Isolation

SWP-MOV55A, Standby Service Water Cooling Tower 1 Inlet

SWP-MOV55B, Standby Service Water Cooling Tower 1 Inlet

ASME Code Class: 3

#### 4.3 Reason for Request (as stated by the licensee)

River Bend Station (RBS) purchased sixteen (16) ASME Class 3 valves from Weir Valves and Controls Company USA, Inc. The 16 valves, listed in Section I [of the licensee's letter dated September 20, 2012] were stamped and certified to be in compliance with ASME Section III. Ten of these valves have been installed at RBS.

On August 2, 2011, a letter was received by Entergy from Weir Valves and Controls Company USA. The letter indicated that, during fabrication, the welding process used to install stainless steel (P-Number 8) seats to carbon steel (P-Number 1) bodies of the subject valves did not fully comply with Table ND-4622.7(b)-1 of the ASME Code. The condition noted was that the base material was not preheated to 200°F [degrees Fahrenheit] (minimum) as required by Table ND-4622.7(b)-1 for exemption from post weld heat treatment. The Weir welding procedure required a minimum preheat of 60°F instead of 200°F. These seat rings are attached to the valve body wall by a 3/16 or 1/4 inch fillet weld on both sides of the ring using [Gas Tungsten Arc Welding (GTAW)] or [Shielded Metal Arc Welding (SMAW)] process.

#### 4.4 Proposed Alternative

The licensee proposes to replace the non-ASME Code compliant valves. The Division "2" valves identified in this submittal will be replaced during RF-18, which currently is scheduled for early 2015. The Division "1" valves identified in this submittal will be replaced during RF-19, which currently is scheduled for early 2017.

#### 4.5 Licensee's Technical Basis

In its request, the licensee proposed that the immediate replacement of the valves under consideration represents a hardship because:

- a. Repairs cannot be made without draining each service water train.
- b. The process of draining the service water train and making the repair will take sufficiently long so as to be prohibited by technical specification during plant operation. Repairs must, therefore, be planned and completed during refueling outages.
- c. Due to the location of some of the valves, significant planning is required to conduct the operation safely, even during an outage. Due to these concerns, conducting repairs to one train during any given outage is desirable.
- d. The lead time for receipt of new valves is approximately 1 year. Valves will not be available in time for the 2013 refueling outage.
- e. Although conducting internal inspections of the valves is possible before the arrival of new valves, the planning process and the access requirements for such an inspection are identical to those needed for valve replacement. Sufficient time is not available to conduct such planning and inspection in a safe manner prior to the 2013 outage.

As noted in Section 2, by letter dated March 5, 2012, Entergy responded to an NRC staff request for additional information on the previous request dated December 11, 2011, related to this relief request. In the letter, the licensee provided a basis for the continued safe operation of the valves under consideration by stating, in part, that:

The worst case failure [of the valves] would be leakage through the seal welds, as any potential cracks in the base material could propagate parallel to the seal weld, but would be blunted by the inherent high fracture toughness of the base metal. None of the valves are in safety-related isolation service, so leakage of a seal weld would be of no safety consequence. In fact, both Section III and Section XI do not require surface examination of these welds, because (1) they are very unlikely to crack, and (2), because of the excessive thickness of the valve body in the seat area, the resulting stresses are only a fraction of those permitted by ASME Section III, making crack propagation extremely improbable.

In its letter dated September 20, 2012, the licensee provided additional basis for the continued safe operation of the valves under consideration by stating, in part, that:

The valves ... will continue to receive all other required inspections and surveillances per Technical Specifications and ASME code.

Other In-Service testing will be maintained. This includes stroke time testing and position indication verification testing.

#### 4.6 NRC Staff Evaluation

As noted in the Section 3.0 of this safety evaluation, prior to authorizing the proposed alternative under 10 CFR 50.55a(a)(3)(ii), the NRC staff must determine that the technical information provided in support of the proposed alternative is sufficient to demonstrate that compliance with ASME Code, Section XI, IWA-4221(b): a) would result in a hardship or unusual difficulty and b) would not provide a compensating increase in the level of quality and safety when compared to the proposed alternative. If these criteria are met, the NRC staff would conclude that the proposed alternatives to ASME Code requirements will provide reasonable assurance of structural integrity or leak tightness of the subject components.

Regarding the first condition of 10 CFR 50.55a(a)(3)(ii), the NRC staff has reviewed the technical basis provided by the licensee in support of the licensee's contention that immediate inspection or replacement of the valves constitutes a hardship. The NRC has reviewed the licensee's basis for this relief and concludes the licensee has demonstrated reasonable assurance of structural integrity or leak tightness and that prompt replacement would constitute a hardship. The NRC staff also agrees with the licensee that repairs cannot be made on-line and that to rush the planning process to accomplish repairs may create a condition adverse to quality and safety. The NRC staff, therefore, concludes that making immediate repairs to the valves would require a plant shutdown and that this constitutes a hardship. Based on the above, the first condition of 10 CFR 50.55a(a)(3)(ii) is satisfied.

Regarding the second condition of 10 CFR 50.55a(a)(3)(ii), whether adherence to the ASME Code requirement would provide an increase in quality and safety commensurate with the hardship or unusual difficulty imposed by meeting the Code requirement, the NRC staff evaluated the technical basis for the alternative as proposed by the licensee and described in Section 4.5 of this safety evaluation. The NRC staff agrees with the licensee that cracking, which may occur due to lack of preheat and/or post-weld heat treatment, will be caused by either 1) the formation of martensite in the weld heat-affected zone and/or 2) the presence of hydrogen as a result of the welding process. The NRC staff also agrees with the licensee's position that any cracking, which may occur due to failure to perform preheat or post-weld heat treatment of this material, will follow the weld. Cracking of this type may result in leakage past the seal but is not expected to result in leakage through the pressure boundary. In addition, the NRC staff notes that any significant cracking of the weld to the point that the valve seat were to become loose would likely be detected by inservice testing of the valve. The NRC staff, therefore, concludes that immediate restoration of the valves under consideration to ASME Code compliance does not provide a compensating increase in the level of quality and safety

when compared to the proposed alternative. Based on the above, the second criterion in 10 CFR 50.55a(a)(3)(ii) is met.

Based on the above, the NRC staff concludes that the technical requirements of 10 CFR 50.55a(a)(3)(ii) have been met and, therefore, that the licensee's proposal provides reasonable assurance of structural and leak tight integrity of the subject components. The NRC staff, therefore, concludes that there is no technical basis that would preclude it from authorizing the licensee's proposed alternative to Article IWA-4221(b) of ASME Code, Section XI.

## 5.0 REGULATORY COMMITMENTS

By letter dated September 20, 2012, Entergy made the following regulatory commitments:

The Division "2" valves identified in this submittal will be replaced during RF-18 currently scheduled for early 2015.

The Division "1" valves identified in this submittal will be replaced during RF-19 currently scheduled for early 2017.

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

## 6.0 CONCLUSION

As set forth above, the NRC staff has determined that the proposed alternative provides reasonable assurance of structural integrity or leak tightness of the subject components and that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii). Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the proposed alternative at RBS for a period of time not to extend beyond the end of the refueling outage scheduled for 2017 (RF-19).

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

Principal Contributor: David Alley

Date: February 20, 2013

The NRC staff's safety evaluation is enclosed. If you have any questions, please contact me at 301-415-1445 or via e-mail at [Alan.Wang@nrc.gov](mailto:Alan.Wang@nrc.gov).

Sincerely,

/RA/

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

Docket No. 50-458

Enclosure:  
Safety Evaluation

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