

August 30, 2006

Mr. Michael Kansler  
President  
Entergy Nuclear Operations, Inc.  
440 Hamilton Avenue  
White Plains, NY 10601

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - RELIEF REQUEST NO. RR-39, IMPLEMENTATION OF BWRVIP GUIDELINES IN LIEU OF ASME SECTION XI CODE REQUIREMENTS ON REACTOR VESSEL INTERNALS AND COMPONENTS INSPECTION (TAC NO. MC8587)

Dear Mr. Kansler:

By letter dated October 7, 2005, as supplemented by letters dated April 3, 2006, and May 31, 2006, Entergy Nuclear Operations, Inc. (Entergy or the licensee) submitted Relief Request RR-39 for James A. FitzPatrick Nuclear Power Plant (JAFNPP). The licensee's submittal proposed to use various Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines as an alternative to certain requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) for inservice inspection (ISI) of reactor vessel internal components. The request was made pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(i).

As documented in the enclosed safety evaluation (SE), the Nuclear Regulatory Commission (NRC) staff reviewed your submittal and concluded that the proposed alternative to the ASME Code requirements is acceptable. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), relief is granted for the third 10-year interval ISI program.

It should be noted that the BWRVIP-76 and BWRVIP-138 reports are currently under review by the NRC staff. Therefore, the licensee's proposed alternative inspection requirements for the core shroud and the jet pump subcomponents which rely on the technical bases established by the BWRVIP-76 and BWRVIP-138 reports, respectively, may need to be revised based on any conditions documented in the NRC staff's final SEs on these reports. Similarly, the licensee's proposed alternative inspection requirements for the shroud support welds may need to be revised based on any conditions documented in the NRC staff's final SE on the BWRVIP-104 report. Also, the licensee has committed to follow the guidelines of the BWRVIP-94 report, which would require the licensee to address any conditions imposed on use of the BWRVIP-76, BWRVIP-104, and BWRVIP-138 reports resulting from the NRC staff's final SEs.

M. Kansler

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If you have any questions regarding this matter, please contact John Boska, the NRC project manager for JAFNPP, at 301-415-2901.

Sincerely,

**/RA/**

Richard J. Laufer, Chief  
Plant Licensing Branch I-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-333

Enclosure:  
As stated

cc w/encl: See next page

M. Kansler

- 2 -

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\*See SE dated June 21, 2006

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Official Record Copy

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO RELIEF REQUEST RR-39  
FOR THE THIRD 10-YEAR INTERVAL OF THE INSERVICE INSPECTION PROGRAM  
ENTERGY NUCLEAR OPERATIONS, INC.  
JAMES A. FITZPATRICK NUCLEAR POWER PLANT  
DOCKET NO. 50-333

1.0 INTRODUCTION

By letter dated October 7, 2005, Agencywide Documents Access and Management System (ADAMS) accession number ML052900075, as supplemented by letters dated April 3, and May 31, 2006, ADAMS accession numbers ML061040275 and ML061640320, Entergy Nuclear Operations, Inc. (Entergy or the licensee) submitted Relief Request RR-39 for James A. FitzPatrick Nuclear Power Plant (JAFNPP). The licensee's submittal proposes to use various Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines as an alternative to certain requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) for inservice inspection (ISI) of reactor vessel internal (RVI) components.

2.0 REGULATORY EVALUATION

ISI of ASME Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of 10 CFR 50.55a(g) may be used, when authorized by the Nuclear Regulatory Commission (NRC), if: (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.

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 ISI 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 inservice examination 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), twelve months prior to the start of the 120-month interval, subject to the limitations and

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modifications listed therein. The applicable ASME Code of record for the third 10-year ISI interval for JAFNPP is the 1989 Edition with no Addenda of ASME Code, Section XI.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Components for Which Relief is Requested

ASME Code, Section XI, Class 1, Examination Categories B—1 and B—2.

Code Item Numbers:

B13.10, Vessel Interior  
B13.20, Interior Attachments within Beltline Region  
B13.30, Interior Attachments beyond Beltline Region  
B13.40, Core Support Structure

#### 3.2 Examination Requirements From Which Relief is Requested

ASME Code, Section XI requires the visual examination (VT) of certain RVI components. These examinations are included in Table IWB-2500-1, Categories B—1 and B—2, and identified with the following item numbers:

- B13.10 - Examine accessible areas of the reactor vessel interior each period by the VT-3 method.
- B13.20 - Examine interior attachment welds within the beltline region each interval by the VT-1 method.
- B13.30 - Examine interior attachment welds beyond the beltline region each interval by the VT-3 method.
- B13.40 - Examine surfaces of the core support structure each interval by the VT-3 method.

These examinations are performed to assess the structural integrity of the RVI components.

#### 3.3 Applicable ASME Code Edition and Addenda

The ASME Code of Record for the third 10-year ISI interval for JAFNPP is the 1989 Edition with no Addenda, of ASME Code, Section XI.

#### 3.4 Licensee's Basis

The licensee concluded that the alternative inspections (described below) will maintain an adequate level of quality and safety of the affected welds and will not adversely impact the health and safety of the public. As part of its justification for the relief, the licensee stated that boiling-water reactors (BWRs) now examine RVI components in accordance with BWRVIP guidelines. These guidelines have been written to address the examination of safety-significant RVI components using appropriate methods and reexamination frequencies. The licensee also

noted that the NRC has agreed with the BWRVIP approach, in principle, and has issued safety evaluations (SEs) for these guidelines. Note that "in principle" means that final NRC SEs have been written for these reports (with the exception of BWRVIP-76, 104, and 138, which are discussed later), but the final BWRVIP acceptance reports which incorporate these SEs may not have been issued for some of the reports. Relief from examinations in Table IWB-2500-1 of the ASME Code are requested pursuant to 10 CFR 50.55a(a)(3)(i).

### 3.5 Alternative Examination:

In lieu of the requirements of the 1989 Edition of the ASME Code, Section XI, the licensee proposed to examine the RVI components in accordance with BWRVIP guidelines. The particular guidelines that are applicable to the various RVI components are:

BWRVIP-18-A, "BWRVIP Core Spray Internals Inspection and Flaw Evaluation Guidelines"

BWRVIP-25, "BWRVIP Core Plate Inspection and Flaw Evaluation Guidelines"

BWRVIP-26-A, "BWRVIP Top Guide Inspection and Flaw Evaluation Guidelines"

BWRVIP-27-A, "BWRVIP BWR Standby Liquid Control System/Core Plate Delta P Inspection and Flaw Evaluation Guidelines"

BWRVIP-38, "BWRVIP Shroud Support Inspection and Flaw Evaluation Guidelines"

BWRVIP-41, "BWRVIP Jet Pump Assembly Inspection and Flaw Evaluation Guidelines"

BWRVIP-47-A, "BWR Lower Plenum Inspection and Flaw Evaluation Guidelines"

BWRVIP-48-A, "Vessel ID Attachment Weld Inspection and Flaw Evaluation Guidelines"

BWRVIP-76, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines"

BWRVIP-104, "BWRVIP Evaluation and Recommendations to Address Shroud Support Cracking in BWRs"

BWRVIP-138, "BWRVIP Updated Jet Pump Beam Inspection and Flaw Evaluation Guidelines"

The licensee made a commitment to incorporate the guidelines of the BWRVIP-94 report, "Program Implementation Guideline," at JAFNPP. The BWRVIP-94 report states that where guidance in existing BWRVIP documents has been supplemented or revised by subsequent correspondence approved by the BWRVIP Executive Committee, the most current approved guidance will be implemented.

In addition to the BWRVIP reports noted above, the licensee identified NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking," as the basis for its proposed alternative examinations for the feedwater sparger tee welds and the feedwater sparger piping and brackets.

The licensee, in its submittal dated October 7, 2005, provided a comparison of the required ASME Code, Section XI Category B—1 and B—2 examination requirements with the above current BWRVIP guidelines that are applicable to JAFNPP. In addition, the licensee provided RVI component inspection histories including results from the last inspections performed during the most recent refueling outage (refueling outage 16, October 2004). Furthermore, the licensee identified the applicable inspection program for the RVI components and the total number of welds in each of the RVI components.



The licensee, as an example, provided additional information regarding the BWRVIP inspection guidelines for the following welds of the RVI components and their subcomponents representing each of the aforementioned ASME Code, Section XI category/item numbers (Item Numbers B13.10, B13.20, B13.30, and B13.40).

- Core Spray
- Jet pump
- Core Shroud Support
- Vessel Attachment Welds (e.g., steam dryer hold-down brackets, guide rod brackets, and surveillance specimen holders)

The licensee claimed that these examples demonstrated that the inspection techniques that are recommended by the BWRVIP inspection guidelines are superior to the inspection techniques mandated by the ASME Code, Section XI ISI program. Additionally, these examples proved that the BWRVIP inspection guidelines require more frequent inspections of the RVI components than the corresponding ASME Code, Section XI ISI program. The licensee claimed that by implementing the BWRVIP inspection guidelines, the aging degradation of the RVI components can be identified in a timely manner so that proper corrective action can be taken to restore the integrity of the applicable RVI component. Therefore, the licensee concluded that implementation of the BWRVIP inspection guidelines for the JAFNPP's RVI components would provide an acceptable level of quality and safety. The licensee's proposed alternative for the RVI components and subcomponents covered under the scope of this relief request is summarized in the Attachment to this SE.

### 3.6 NRC Staff Evaluation

The NRC staff reviewed the information provided by the licensee in its submittal dated October 7, 2005, regarding its proposed alternatives to the ASME Code, Section XI ISI requirements and the technical bases for the licensee's proposed alternatives. The NRC staff reviewed the status of each of the referenced BWRVIP guidance documents and the applicability of the information provided in NUREG-0619. The NRC staff found all of the referenced BWRVIP reports (with the exception of the BWRVIP-76, BWRVIP-104, and BWRVIP-134 reports, which are under NRC staff review) to be acceptable, with any additional conditions associated with the implementation of the subject BWRVIP reports outlined in the corresponding NRC staff SE for that report. The NRC staff also confirmed the applicability of the information given in NUREG-0619 to support the licensee's proposed alternative for the feedwater sparger tee welds and the feedwater sparger piping and brackets. The NRC staff did, however, identify some issues which required additional clarification by the licensee or which required the licensee to modify its proposed alternatives. The following paragraphs address the NRC staff's requests for additional information (RAIs), the licensee's responses, and the NRC staff's evaluation of the RAIs.

In the RAI letter dated February 9, 2006, the NRC staff stated that the inspection frequency for the core shroud welds as indicated in Section 6.4 of the submittal dated October 7, 2005, is not consistent with the frequencies specified in Sections 3.3 and 3.4 of the BWRVIP-76 report. Therefore, the NRC staff requested that the licensee revise the inspection frequency requirements for the subject welds in Section 6.4 of the submittal dated October 7, 2005. The licensee, in its response dated April 3, 2006, revised Section 6.4 of the submittal dated

October 7, 2005, to include inspection frequency that is consistent with the BWRVIP-76 guidelines. The NRC staff finds this response acceptable.

In the RAI letter dated February 9, 2006, the NRC staff also requested that the licensee include inspection intervals for the core shroud horizontal welds H1, H2, and H8. The licensee, in its response dated April 3, 2006, stated that H1, H2, and H8 welds were structurally replaced by the tie rod repairs, and the tie rods, consistent with the BWRVIP-76 guidelines, are inspected at 10-year intervals. The NRC staff finds this response acceptable because the inspection interval for the tie rods is consistent with the BWRVIP-76 guidelines and a 10-year inspection interval has been found acceptable by the NRC for similar components.

In the RAI letter dated February 9, 2006, the NRC staff stated that the inspection frequency specified in the licensee's submittal dated October 7, 2005, for the top guide ring segment radial welds is not consistent with Figure 3-3 of the BWRVIP-76 guidelines. Therefore, the NRC staff requested that the licensee revise the inspection frequency requirement for the subject welds in its submittal dated October 7, 2005. The licensee, in its response dated April 3, 2006, stated that the shroud repair designer recommends that the subject welds be inspected using enhanced visual (EVT-1) or ultrasonic test (UT) methods every 10 years, which is consistent with the BWRVIP-76 guidelines. The licensee also indicated that previous inspections of the subject welds did not show any indications. Since there is no active degradation in the subject welds, the NRC staff agrees that the licensee's proposed inspection frequency is acceptable.

Previous experience in BWRs indicated that noble metal chemical application (NMCA), in conjunction with hydrogen addition to the reactor water, mitigated intergranular stress-corrosion cracking (IGSCC). IGSCC is one of the most prominent aging degradation mechanisms in the RVI components. In a conference call on March 8, 2006, the NRC staff requested that the licensee provide information regarding the implementation of NMCA at JAFNPP. The licensee in its letter dated April 3, 2006, stated that it uses hydrogen water chemistry (HWC) and NMCA with a hydrogen to oxygen molar concentration value greater than 3 to 1. The NRC staff finds this response acceptable because the aforementioned hydrogen to oxygen molar concentration value is effective in mitigating IGSCC in the RVI components. The NRC staff believes that implementation of HWC and NMCA in conjunction with the implementation of the applicable BWRVIP inspection guidelines for the JAFNPP's RVI components would ensure their integrity and would provide an acceptable level of quality and safety.

With respect to the NRC staff's inquiry related to the inspection criteria for the core shroud H12 weld, and the jet pump riser welds (RS-4 and RS-5), the licensee, in its response dated April 3, 2006, has stated that JAFNPP does not have the H12 weld or the jet pump riser welds RS-4 and RS-5. The NRC staff finds this response acceptable.

In the RAI letter dated February 9, 2006, the NRC staff also requested that the licensee provide inspection requirements and the inspection frequency for the JAFNPP's RVI components. The licensee, in its response dated April 3, 2006, provided a listing of the JAFNPP's RVI components, with corresponding inspection bases, and the currently planned inspection schedule through the year 2014. The NRC staff reviewed the licensee's response and identified an inconsistency between the inspection methods proposed by the licensee and the inspection methods contained in the BWRVIP-25 guidelines for the core plate hold-down bolts.

In a conference call on May 11, 2006, the NRC staff requested that the licensee revise its submittal dated April 3, 2006, to include inspection methods that are consistent with the BWRVIP-25 guidelines for the core plate hold-down bolts. The licensee, in its response dated May 31, 2006, withdrew core plate hold-down bolts from this relief request and stated that it will inspect the core plate hold-down bolts in accordance with the requirements specified in the ASME Code, Section XI ISI program. The NRC staff finds this response acceptable.

Therefore, based on the information in the licensee's submittals dated October 7, 2005, April 3, and May 31, 2006, the NRC staff has confirmed that the licensee's proposed alternatives (as documented in the attachment to this SE) are consistent with the technical bases documented in NUREG-0619 and the BWRVIP reports cited in Section 3.0 of this SE.

Consistent with the determination that was made in the NRC staff's SEs which approved each of the cited BWRVIP reports (with the exception of the BWRVIP-76, BWRVIP-104, and BWRVIP-138 reports), the BWRVIP inspection guidelines (as supplemented by the NUREG-0619 guidelines) incorporated into the licensee's proposed alternative will identify aging degradation of the RVI components in a timely manner. Therefore, the NRC staff has concluded that the implementation of the inspection requirements specified in the licensee's proposed alternative will ensure that the integrity of the RVI components will be maintained with an acceptable level of quality and safety.

It should be noted that the BWRVIP-76 and BWRVIP-138 reports are currently under review by the NRC staff. Therefore, the licensee's proposed alternative inspection requirements for the core shroud and the jet pump subcomponents which rely on the technical bases established by the BWRVIP-76 and BWRVIP-138 reports, respectively, may need to be revised based on any conditions documented in the NRC staff's final SEs on the BWRVIP-76 and the BWRVIP-138 reports. Similarly, the licensee's proposed alternative inspection requirements for the shroud support welds may need to be revised based on any conditions documented in the NRC staff's final SE on the BWRVIP-104 report. This will, however, be addressed as the licensee has committed to follow the guidelines of the BWRVIP-94 report, which would require the licensee to address any conditions imposed on use of the BWRVIP-76, BWRVIP-104, and BWRVIP-138 reports resulting from the NRC staff's final SE. The NRC staff's initial review of BWRVIP-76, 104, and 138 indicates that the proposed inspections will provide an acceptable level of quality and safety. If the licensee decides to take any exceptions to or deviations from the NRC staff-approved inspection guidelines specified in the aforementioned BWRVIP reports or the ASME Code, Section XI ISI requirements, then it shall submit a revised relief request indicating the exceptions or deviations to the NRC staff. The licensee shall obtain NRC staff approval for the revised relief request prior to implementing the revised inspection guidelines for the JAFNPP's RVI components.

#### 4.0 CONCLUSION

Based on the information provided in the licensee's submittals, the NRC staff concludes that the alternatives proposed in Relief Request RR-39, and as summarized in the attachment to this SE, will ensure that the integrity of the RVI components is maintained with an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternatives are authorized for the third 10-year inspection interval. All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector. Any

components that are not included in this Relief Request will continue to be inspected in accordance with the ASME Code, Section XI requirements.

Principal Contributor: G. Cheruvenki

Date: August 30, 2006

**ATTACHMENT**

**James A. FitzPatrick Comparison of ASME Category B—1 and B—2 Requirements  
With BWRVIP Guidance <sup>(1)</sup>**

ASME Item No. Table IWB-2500-1	Component	ASME Exam Scope	ASME Exam	ASME Frequency	Applicable BWRVIP Document	BWRVIP Exam Scope	BWRVIP Exam	BWRVIP Frequency
B13.10	Reactor Vessel Interior <sup>(2)</sup>	Accessible Areas (Non-specific)	VT-3	Each period	BWRVIP-18-A, 25, 26-A, 27-A, 38, 41, 47-A, 48-A, 76, 104 and 138	In accordance with applicable BWRVIP document.		
B13.20	Interior Attachments Within Beltline – Jet Pump Riser Braces	Accessible Welds	VT-1	Each 10- year Interval	BWRVIP-48-A Table 3-2	Riser Brace Attachment	EVT-1	100% in first 12 years (with 50% to be inspected in the first 6 years); 25% during each subsequent 6 years
	Lower Surveillance Specimen Holder Brackets				BWRVIP-48-A Table 3-2	Bracket Attachment	VT-1	Each 10-year Interval
B13.30	Interior Attachments Beyond Beltline – Steam Dryer Hold- down Brackets	Accessible Welds	VT-3	Each 10- year Interval	BWRVIP-48-A Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval
	Guide Rod Brackets				BWRVIP-48-A Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval
	Steam Dryer Support Brackets				BWRVIP-48-A Table 3-2	Bracket Attachment	EVT-1	Each 10-year Interval
	Feedwater Sparger Brackets				BWRVIP-48-A Table 3-2	Bracket Attachment	EVT-1	Each 10-year Interval
	Core Spray Piping Brackets				BWRVIP-48-A Table 3-2	Bracket Attachment	EVT-1	Every 4 Refueling Cycles
	Upper and Middle Surveillance Specimen Holder Brackets				BWRVIP-48-A Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval
	Shroud Support (Weld H9)				BWRVIP-38 3.1.3.2, Figure 3-5 and BWRVIP-104	Weld H9	EVT-1 or UT	Maximum of 6 years for one sided EVT-1, Maximum of 10 years for UT
	Weld H12				Not Applicable	Not Applicable	Not Applicable	Not Applicable

**ATTACHMENT**

**James A. FitzPatrick Comparison of ASME Category B—1 and B—2 Requirements  
With BWRVIP Guidance <sup>(1)</sup>**

ASME Item No. Table IWB-2500-1	Component	ASME Exam Scope	ASME Exam	ASME Frequency	Applicable BWRVIP Document	BWRVIP Exam Scope	BWRVIP Exam	BWRVIP Frequency
B13.40	Integrally Welded Core Support Structure – Shroud Support	Accessible Surfaces	VT-3	Each 10- year Interval	BWRVIP-38 3.1.3.2, 3.2.1, Figures 3-5 and 3-6 & BWRVIP- 104	Weld H9 and Gusset Attachments	EVT-1 or UT	Maximum 6 years for one-sided EVT-1, 10 years for UT
	Shroud				BWRVIP-76 Figures 3-3 and 3-4	Vertical and Top Guide Ring Segment Welds	EVT-1 or UT	Maximum 10 years (per designer recommendations)
					BWRVIP-76 3.5 and 3.6	Tie-rod Repair	VT-3 and EVT-1	All 10 tie rods within 10 years

Notes:

1. This Table provides only an overview of the requirements. For more details, refer to the ASME Code, Section XI, Table IWB-2500-1, and the appropriate BWRVIP document.
2. Per New York Power Authority (NYPA) letter to NRC (JPN-97-013), "Core Spray Internals Inspection," dated March 24, 1997, JAFNPP informed the NRC of a new commitment to perform Core Spray System piping and spargers inspections inside the RPV in accordance with the BWRVIP-18 guidelines.