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May 16, 2013

RBG-47362

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Request for Alternative in Accordance with 10 CFR 50.55a(a)(3)(i)
Use of Boiling Water Reactor Vessel and Internals Project (BWRVIP)
Guidelines in Lieu of Specific ASME Code Requirements
River Bend Station
Docket No. 50-458
License No. NPF-47

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy Operations, Inc (Entergy) hereby requests an alternative to specific portions of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," on the basis that the proposed alternative provides an acceptable level of quality and safety. Specifically, this proposed alternative requests the use of the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines in lieu of specific ASME Code Section XI Requirements.

Attachment 1 provides the Request for Alternative; Attachment 2 provides a comparison of ASME Code Section XI examination requirements to BWRVIP examination requirements; and Attachment 3 provides the reactor vessel internal inspection history for River Bend Station through the latest refueling outage.

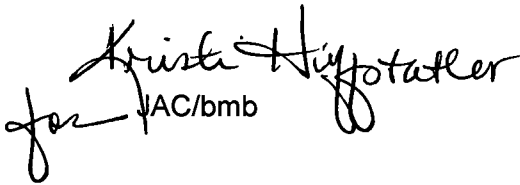
Entergy requests NRC Staff review and approval of this Request for Alternative by June 1, 2014.

A047
NRR

There are no new commitments included in this document.

If you have any questions concerning this letter, please contact me at (225)-381-4177.

Sincerely,


for AC/bmb

Attachments:

1. Request for Alternative - Use of BWRVIP Guidelines in Lieu of Specific ASME Code Section XI Requirements, RBS-ISI-019
2. Comparison of ASME Code Section XI Examination Requirements to BWRVIP Examination Requirements, RBS-ISI-019
3. Entergy Facilities Reactor Vessel Internal Inspection Histories, RBS-ISI-019

RBF1-13-0059

cc: Regional Administrator
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ATTACHMENT 1 TO
RBG-47362
REQUEST FOR ALTERNATIVE
USE OF BWRVIP GUIDELINES IN LIEU OF SPECIFIC
ASME CODE SECTION XI REQUIREMENTS
RBS-ISI-019

Proposed Alternative

RBS-ISI-019

Use of Boiling Water Reactor Vessel and Internals Project (BWRVIP) Guidelines in Lieu of Specific ASME Code Requirements In Accordance with 10 CFR 50.55a(a)(3)(i)

1. ASME Code Components(s) Affected

Components: See Table 1

Code Class: ASME Code Class 1

Examination Category: B-N-1 and B-N-2

Item Number(s):

- B 13.10 - Vessel interior
- B 13.20 - Interior attachments (welds) within beltline region
- B 13.30 - Interior attachments (welds) beyond beltline region
- B 13.40 - Core support structure

2. Applicable Code Edition and Addenda

ASME Section XI, 2001 Edition through 2003 Addenda

3. Applicable Code Requirements

ASME Section XI requires the examination of components within the Reactor Pressure Vessel. These examinations are included in Table IWB-2500-1 Category B-N-1 and B-N-2 and identified with the following item numbers:

B 13.10 Examine accessible areas of the reactor vessel interior each period by the VT-3 method (B-N-1).

B 13.20 Examine interior attachment welds within the beltline region each interval by the VT-1 method (B-N-2).

B 13.30 Examine interior attachment welds beyond the beltline region each interval by the VT-3 method (B-N-2).

B 13.40 Examine surfaces of the welded core support structure each interval by the VT-3 method (B-N-2).

These examinations are performed to assess the structural integrity of components within the boiling water reactor pressure vessel.

4. Reason for Request

In accordance with 10 CFR 50.55a(a)(3)(i), Entergy is requesting NRC approval of a proposed alternative to the Code requirements on the basis that the use of the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines discussed below will provide an acceptable level of quality and safety.

The BWRVIP Inspection and Evaluation (I&E) guidelines have recommended aggressive specific inspection by BWR operators to completely identify material condition issues with BWR components. A wealth of inspection data has been gathered during these inspections across the BWR industry. The BWRVIP I&E guidelines focus on specific and susceptible components, specify appropriate inspection methods capable of identifying real anticipated degradation mechanisms, and require re-examination at conservative intervals. In contrast, the code inspection requirements were prepared before the BWRVIP initiative and have not evolved with BWR inspection experience.

Use of this proposed alternative will maintain an adequate level of quality and safety and avoid unnecessary inspections, while conserving radiological exposure.

5. Proposed Alternative and Basis for Use

Proposed Alternative

Entergy requests authorization to utilize the alternative requirements of the BWRVIP Guidelines in lieu of the requirements of ASME Code Section XI Table IWB-2500-1. The proposed alternative is detailed in Table 1 for Examination Category B-N-1 and B-N-2.

Entergy proposes to satisfy the Examination Category B-N-1 and B-N-2 requirements as described in Table 1 in accordance with BWRVIP guideline requirements. This request for alternative proposes to utilize the identified BWRVIP guidelines in lieu of the associated Code requirements, including examination method, examination volume, frequency, training, successive and additional examinations, flaw evaluations, and reporting.

The guidelines applicable to the subject Code Components in this proposed alternative are the following. Not all the components addressed by these guidelines are ASME Code Section XI components.

- BWRVIP-03, "BWR Vessel and Internals Project, Reactor Pressure Vessel and Internal Examination Guidelines"
- BWRVIP-18, Revision 1, "BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines"
- BWRVIP-25, "BWR Core Plate Inspection and Flaw Evaluation Guidelines"
- BWRVIP-26-A, "BWR Top Guide Inspection and Flaw Evaluation Guidelines"
- BWRVIP-27-A, BWR Standby Liquid Control System/Core Plate Δ P Inspection and Flaw Evaluation Guidelines"

- BWRVIP-38, "BWR Shroud Support Inspection and Flaw Evaluation Guidelines"
- BWRVIP-41, Revision 3, "BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines"
- BWRVIP-42, Revision 1, " Low Pressure Coolant Injection (LPCI) Coupling Inspection and Flaw Evaluations"
- BWRVIP-47-A, "BWR Lower Plenum Inspection and Flaw Evaluation Guidelines"
- BWRVIP-48-A, "BWRVIP Vessel ID Attachment Weld Inspection and Flaw Evaluation Guidelines"
- BWRVIP-76, Revision 1, "BWR Core Shroud Inspection and Flaw Evaluation Guidelines"
- BWRVIP-94, Revision 2, "BWRVIP Vessel and Internals Project Program Implementation Guide"
- BWRVIP-100 Revision 1, Updated Assessment of the Fracture Toughness of Irradiated Stainless Steel for BWR Core Shrouds"

Note: If flaw evaluations are required for BWRVIP-76 examinations, the fracture toughness values of BWPVIP-100-A will be utilized.

Table 1 below compares current ASME Code Section XI IWB-2500-1, Examination Category B-N-1 and B-N-2 requirements with the above current BWRVIP guideline requirements, as applicable, to Entergy's BWR/6 units.

In addition, the Entergy reactor vessel internals inspection programs have been developed and implemented to satisfy the requirements of BWRVIP-94, "BWRVIP Vessel and Internals Project Program Implementation Guide." It is recognized that the BWRVIP executive committee periodically revises the BWRVIP guidelines to include enhancements in inspection techniques and flaw evaluation methodologies. BWRVIP-94, Revision 2 states that where guidance in existing BWRVIP documents has been supplemented or revised by subsequent correspondence approved by the BWRVIP Executive Committee, the vessel and internals program shall be modified to reflect the new requirements and implement the guidance within two refueling outages, unless a different schedule is specified by the BWRVIP. However, if new guidance approved by the Executive Committee includes changes to NRC approved BWRVIP guidance that are less conservative than those approved by the NRC, this less conservative guidance shall be implemented only after NRC approves the changes, which generally means publication of a "-A" document or equivalent. This process is included in the current program.

Therefore, where the revised version of a BWRVIP inspection guideline continues to also meet the requirements of the version of the BWRVIP inspection guideline that forms the safety basis for the NRC authorized proposed alternative to the requirements of 10 CFR 50.55a, it may be implemented. Otherwise, the revised guidelines will only be implemented after NRC approval of the revised BWRVIP guidelines or a plant-specific request for alternative has been approved. Table 1 below represents the most current comparison.

Per the current program any deviations from the referenced BWRVIP Guidelines for the duration of the proposed alternative will be appropriately documented and communicated to the NRC, per the BWRVIP Deviation Disposition Process. Currently, any Entergy deviations from the subject guidelines above are summarized in Table 1 below.

Inspection services, by an Authorized Inspection Agency, will also be applied to the proposed alternative actions of this Request for Alternative.

Basis for Use

BWRs now examine reactor internals in accordance with BWRVIP guidelines. These guidelines have been written to address the safety significant vessel internal components and to examine and evaluate the examination results for these components using appropriate methods and reexamination frequencies. The BWRVIP has established a reporting protocol for examination results and deviations. The NRC has agreed with the BWRVIP approach in principal and has issued Safety Evaluations for many of these guidelines (see References).

As additional justification, Attachment 2, Comparison of Code Examination Requirements to BWRVIP Examination Requirements provides specific examples which compare the inspection requirements of ASME Code Section XI Table IWB-2500-1, Item Numbers B13.10, B13.20, B13.30, and B13.40 to the inspection requirements in the BWRVIP documents. Specific BWRVIP documents are provided as examples. This comparison also includes a discussion of the inspection methods.

Therefore, the use of the BWRVIP guidelines as an alternative to the subject Code requirements, as shown by the comparison of Code Examination Requirements to BWRVIP Examination Requirements in Table 1 and Attachment 2, provide an acceptable level of quality and safety and will not adversely impact the health and safety of the public.

6. Duration of Proposed Alternative

The duration of the proposed alternative is for River Bend's fourth interval commencing on **May 31, 2008** and ending on **November 30, 2017**.

7. Precedents

Similar Request for Alternatives have been previously approved for the following Entergy and other industry plants.

- A. US NRC Letter to Entergy Nuclear Operations, "Safety Evaluation of Relief Request RI-01, Vermont Yankee Nuclear Power Station TAC. No. MC0690), dated September 19, 2005 (ADAMS-Accession Number ML052370244).
- B. US NRC Letter to Entergy Nuclear Operations, James A. Fitzpatrick Nuclear Power Plant, "Relief Request No. RR-6, Implementation of BWRVIP Guidelines in Lieu of ASME Code, Section XI Requirements on Reactor Vessel Internals Components Inspection (TAC NO. MD4758), dated February 28, 2008 (ADAMS-Accession Number ML080300307).

- C. US NRC Letter to FirstEnergy Nuclear Operating Company, "Perry Nuclear Power Plant, Unit No.1, RE: Safety Evaluation in Support of 10 CFR 50.55a Requests for the Third 10-Year In-service Inspection Interval (TAC Nos. ME5373, ME5376, ME5377, ME5379, AND ME5380) dated January 31, 2012 (ADAMS-Accession Number ML120180372)
- D. US NRC Letter to Detroit Edison Co, "Fermi 2 - Evaluation of Applicable 10-Year Interval Inservice Inspection Relief Request - Use of Boiling Water Reactor Vessel and Internals Project (BWRVIP) Guidelines in Lieu of Specific ASME Code Requirements (TAC NO. ME6765), dated February 17, 2012 (ADAMS-Accession Number ML120370286)

8. References

- A. Letter from NRC to BWRVIP, "Final Safety Evaluation for Electric Power Research Institute Boiling Water Reactor Vessel and Internals Project Technical Report 1016568, 'BWRVIP-18, Revision 1: BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines (TAC No. ME2189)' , " dated January 30,2012 (ML113620684)
- B. US NRC Letter to BWRVIP, dated December 19, 1999, "Final Safety Evaluation of BWRVIP Vessel and Internals Project, "BWR Vessel and Internals Project, BWR Core Plate Inspection and Flaw Evaluation Guidelines (BWRVIP-25)", EPRI Report TR-107284, December 1996 (TAC NO. M97802)
- C. US NRC Letter to BWRVIP, dated September 9, 2005, "NRC Approval Letter of BWRVIP-26-A, "BWR Vessel and Internals Project Boiling Water Reactor Top Guide Inspection and Flaw Evaluation Guidelines"
- D. US NRC Letter to BWRVIP, dated June 10, 2004, Proprietary Version of NRC Staff Review of BWRVIP-27-A, "BWR Standby Liquid Control System/Core Plate ΔP Inspection and Flaw Evaluation Guidelines"
- E. US NRC Letter to BWRVIP, dated July 24, 2000, "Final Safety Evaluation of the "BWR Vessel and Internals Project, BWR Shroud Support Inspection and Flaw Evaluation Guidelines (BWRVIP-38)," EPRI Report TR-108823 (TAC NO. M99638)
- F. US NRC Letter to BWRVIP, dated February 4, 2001, "Final Safety Evaluation of the "BWR Vessel and Internals Project, BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines (BWRVIP-41)," (TAC NO. M99870)
- G. BWRVIP-42NP, Revision 1 "BWR Vessel and Internals Project, Low Pressure Coolant Injection (LPCI) Coupling Inspection and Flaw Evaluations" dated October 2012 (ML12349A309)"
- H. US NRC Letter to BWRVIP, dated September 9, 2005, "NRC Approval Letter of BWRVIP-47-A, "BWR Vessel and Internals Project Boiling Water Reactor Lower Plenum Inspection and Flaw Evaluation Guidelines"
- I. US NRC Letter to BWRVIP, dated July 25, 2005, "NRC Approval Letter of BWRVIP- 48-A, "BWR Vessel and Internals Project Vessel ID Attachment Weld Inspection and Flaw Evaluation Guidelines"

- J. BWRVIP-76NP, Revision 1: BWR Vessel and Internals Project BWR Core Shroud Inspection and Flaw Evaluation Guidelines, " dated May 2011 (ML11195A182)
- K. Letter from Chairman, BWR Vessel and Internals Project to NRC, "Project No. 704 - BWRVIP Program Implementation Guide (BWRVIP-94NP, Revision 2)," dated September 22, 2011 (MLI1271A058)
- L. US NRC Letter to BWRVIP, dated November 1, 2007, "NRC Approval Letter of Comment for BWRVIP-100-A, BWR Vessel and Internals Project, Updated Assessment of the Fracture Toughness of Irradiated Stainless Steel for BWR Core Shrouds"

Table 1
Comparison of ASME Code Section XI Table IWB-2500-1 Examination
Category B-N-1 and B-N-2 Requirements to BWRVIP Guidance Requirements ⁽¹⁾

ASME Table IWB-2500-1 Item No.	Component	ASME Exam Scope	ASME Exam	ASME Frequency	Applicable BWRVIP Alternative	BWRVIP Exam Scope	BWRVIP Exam	BWRVIP Frequency
B13.10	Reactor Vessel Interior	Accessible Areas (Non-specific)	VT-3	Each Period	BWRVIP-18-R1, 25, 26-A, 27-A, 38, 41 42-R1, 47-A, 48-A, 76-R1	Overview examinations of components during BWRVIP examinations are performed to satisfy Code VT-3 inspection requirements.		
B13.20	Interior Attachments Within Bellline - 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, 25% during each subsequent 6 years
	BWRVIP-48-A Table 3-2				Bracket Attachment	VT-1	Each 10-year Interval	
	Lower Surveillance Specimen Holder Brackets							

ASME Table IWB-2500-1 Item No.	Component	ASME Exam Scope	ASME Exam	ASME Frequency	Applicable BWRVIP Alternative	BWRVIP Exam Scope	BWRVIP Exam	BWRVIP Frequency
B13.30	Interior Attachments Beyond Beltline - Steam Dryer Hold-down Brackets	(Rarely Accessible)	VT-3	Each 10-year Interval	BWRVIP-48-A Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval
	BWRVIP-48-A Table 3-2				Bracket Attachment	VT-3	Each 10-year Interval	
	BWRVIP-48-A Table 3-2				Bracket Attachment	EVT-1	Each 10-year Interval	
	BWRVIP-48-A Table 3-2				Bracket Attachment	EVT-1	Each 10-year Interval	
	BWRVIP-48-A Table 3-2				Bracket Attachment	EVT-1	Every 4 Refueling Cycles	
	BWRVIP-48-A Table 3-2				Bracket Attachment	VT-3	Each 10-year Interval	
	BWRVIP-38 ⁽⁴⁾ Section 3.1.3.2 Figures 3-2 and 3-5				Weld H9 ⁽²⁾ including gussets	EVT-1 or UT	Maximum of 6 years for EVT-1, Maximum of 10 years for UT	
	BWRVIP-38 ⁽⁴⁾ Section 3.2.3				Weld H12	Per ⁽³⁾ BWRVIP-38 NRC SER (7/24/2000), inspect with appropriate method	When Accessible	

ASME Table IWB-2500-1 Item No.	Component	ASME Exam Scope	ASME Exam	ASME Frequency	Applicable BWRVIP Alternative	BWRVIP Exam Scope	BWRVIP Exam	BWRVIP Frequency
B13.40	Welded Core Support Structure - Shroud Support	Accessible Surfaces	VT-3	Each 10-year Interval	BWRVIP-38 ⁽⁴⁾ Section 3.1.3.2 Figures 3-2 and 3-5	Shroud Support Weld H8 / H9 and Leg Welds including gussets as applicable	EVT-1 or UT	Based on as-found conditions to a maximum 6 years for one side EVT-1, 10 years for UT where accessible
	Shroud Horizontal Welds				BWRVIP-76-R1 Section 2.2 Figure 3-3	Welds H1-H7 as applicable	EVT-1 or UT	Based on as-found conditions to a maximum 10 years for UT when inspected from both sides of the welds
	Shroud Vertical Welds				BWRVIP-76-R1 Section 2.3 Figure 3-3	Vertical and Ring-Segment Welds as applicable	EVT-1 or UT	Maximum 6 years for one-sided EVT-1, 10 years for UT of horizontal welds
	Shroud Repairs ⁽⁵⁾				BWRVIP-76-R1 Section 3.5	Tie-Rod Repair	VT-3	In accordance with designer recommendations per BWRVIP-76 R1

Note:

- (1) This table provides only an overview of the requirements. For more details, refer to ASME Section XI, Table IWB-2500-1 and the appropriate BWRVIP Document.
- (2) In accordance with Appendix A of BWRVIP-38, a site specific evaluation will determine the minimum required weld length to be examined.
- (3) When inspection tooling and methodologies are available, they will be utilized to establish a baseline inspection of these welds.
- (4) Deviation to BWRVIP-38 was submitted to extend the 10 year ultrasonic reinspection frequency by an additional 6 months, starting 10/31/2014 and ending when the subject reinspections are performed in refueling outage 18, currently scheduled for 2/2015.
- (5) No repairs have been performed on the shroud, however; if shroud repairs are performed in the future then this submittal request includes use of the BWRVIP guidance for this examination.

ATTACHMENT 2 TO

RBG-47362

**COMPARISON OF ASME CODE SECTION XI EXAMINATION
REQUIREMENTS TO BWRVIP EXAMINATION REQUIREMENTS**

RBS-ISI-019

COMPARISON OF ASME CODE SECTION XI EXAMINATION REQUIREMENTS TO BWRVIP EXAMINATION REQUIREMENTS

The following discussion provides a comparison of the examination requirements provided in ASME Code Section XI Table IWB-2500-1, examination category B-N-1 and B-N-2, Item Numbers B13.10, B13.20, B13.30, and B13.40, to the examination requirements in the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines. Specific BWRVIP guidelines are provided as examples for comparisons. This comparison also includes a discussion of the examination methods.

1. Code Requirement - B13.10 - Reactor Vessel Interior Accessible Areas (B-N-1)

The ASME Section XI Code requires a VT-3 examination of reactor vessel accessible areas, which are defined as the spaces above and below the core made accessible during normal refueling outages. The frequency of these examinations is specified as the first refueling outage, and at intervals of approximately 3 years, during the first inspection interval, and each period during each successive 10-year Inspection Interval. Typically, these examinations are performed every other refueling outage of the Inspection Interval. This examination requirement is a non-specific requirement that is a departure from the traditional Section XI examinations of welds and surfaces. As such, this requirement has been interpreted and satisfied differently across the domestic fleet. The purpose of the examination is to identify relevant conditions such as distortion or displacement of parts, loose, missing, or fractured fasteners, foreign material, corrosion, erosion, or accumulation of corrosion products, wear, and structural degradation.

Portions of the various examinations required by the applicable BWRVIP Guidelines require access to accessible areas of the reactor vessel during each refueling outage. Examination of Core Spray Piping and Spargers (BWRVIP-18-R1), Top Guide (BWRVIP-26-A), Jet Pump Welds and Components (BWRVIP-41-R3), Interior Attachments (BWRVIP-48-A), Core Shroud Welds (BWRVIP-76-R1), Shroud Support (BWRVIP-38), LPCI couplings (BWRVIP-42-R1), and Lower Plenum Components (BWRVIP-47-A) provides such access. Locating and examining specific welds and components within the reactor vessel areas above, below (if accessible), and surrounding the core (annulus area) entails access by remote camera systems that essentially perform equivalent VT-3 examination of these areas or spaces as the specific weld or component examinations are performed. This provides an equivalent method of visual examination on a more frequent basis than that required by the ASME Section XI Code. Evidence of wear, structural degradation, loose, missing, or displaced parts, foreign materials, and corrosion product buildup can be, and has been observed during the course of implementing these BWRVIP examination requirements.

Therefore, the specified BWRVIP Guideline requirements meet or exceed the subject Code requirements for examination method and frequency of the interior of the reactor vessel. Accordingly, these BWRVIP examination requirements provide an acceptable level of quality and safety as compared to the subject Code requirements.

2. Code Requirement - B 13.20 - Interior Attachments Within the Beltline (B-N-2)

The ASME Section XI Code requires a VT-1 examination of accessible reactor interior surface attachment welds within the beltline each 10-year interval. In the boiling water reactor, this includes the jet pump riser brace welds-to-vessel wall and the lower surveillance specimen support bracket welds-to-vessel wall. In comparison, the BWRVIP requires the same examination method and frequency for the lower surveillance specimen support bracket welds, and requires an EVT-1 examination on the remaining attachment welds in the beltline region in the first 12 years, and then 25% during each subsequent 6 years.

The jet pump riser brace examination requirements are provided below to show a comparison between the Code and the BWRVIP examination requirements.

Comparison to BWRVIP Requirements - Jet Pump Riser Braces (BWRVIP-41) and BWRVIP-48-A)

- The ASME Code requires a 100% VT-1 examination of the jet pump riser brace-to-reactor vessel wall pad welds each 10-year interval.
- The BWRVIP requires an EVT-1 examination of the jet pump riser brace-to-reactor vessel wall pad welds the first 12 years and then 25% during each subsequent 6 years.
- BWRVIP-48-A specifically defines the susceptible regions of the attachment that are to be examined.

The Code VT-1 examination is conducted to detect discontinuities and imperfections on the surfaces of components, including such conditions as cracks, wear, corrosion, or erosion. The BWRVIP enhanced VT-1 (EVT-1) is conducted to detect discontinuities and imperfections on the surface of components and is additionally specified to detect potentially very tight cracks characteristic of fatigue and intergranular stress corrosion cracking (IGSCC), the relevant degradation mechanisms for these components. General wear, corrosion, or erosion although generally not a concern for inherently tough, corrosion resistant stainless steel material, would also be detected during the process of performing a BWRVIP EVT-1 examination.

The ASME Code visual examination method requires (depending on applicable ASME Edition) that a letter character with a height of 0.044 inches can be read. The BWRVIP EVT-1 visual examination method requires the same 0.044 inch resolution on the examination surface and additionally the performance of a cleaning assessment and cleaning as necessary. While the jet pump riser brace configuration varies depending on the vessel manufacturer, BWRVIP-48-A includes diagrams for each configuration and prescribes examination for each configuration.

The calibration standards used for BWRVIP EVT-1 exams utilize the same Code characters, thus assuring at least equivalent resolution compared to the Code. Although the BWRVIP examination may be less frequent, it is a more comprehensive method. Therefore, the enhanced flaw detection capability of an EVT-1, with a less frequent examination schedule provides an acceptable level of quality and safety to that provided by the ASME Code.

3. Code Requirement - B13.30 - Interior Attachment Beyond the Beltline Region (B-N-2)

The ASME Section XI Code requires a VT-3 examination of accessible reactor interior surface attachment welds beyond the beltline each 10-year interval. In the boiling water reactor, this includes the core spray piping primary and supplemental support bracket welds to-vessel wall, the upper surveillance specimen support bracket welds-to-vessel wall, the feedwater sparger support bracket welds-to-reactor vessel wall, the steam dryer support and hold down bracket welds-to-reactor vessel wall, the guide rod support bracket weld-to reactor vessel wall, the shroud support plate-to-vessel welds, and shroud support gussets. BWRVIP-48-A requires as a minimum the same VT-3 examination method as the Code for some of the interior attachment welds beyond the beltline region, and in some cases specifies an enhanced visual examination technique EVT-1 for these welds. For those interior attachment welds that have the same VT-3 method of examination, the same scope of examination (accessible welds), the same examination frequency (each 10 year interval) and ASME Section XI flaw evaluation criteria, the level of quality and safety provided by the BWRVIP requirements are equivalent to that provide by the ASME Code.

For the Core Spray support bracket attachment welds, the steam dryer support bracket attachment welds, the feedwater sparger support bracket attachment welds, and the shroud support plate-to-vessel welds, as applicable, the BWRVIP Guidelines require an EVT-1 examination at the same frequency as the Code, or at a more frequent rate. Therefore, the BWRVIP requirements provide the same level of quality and safety to that provided by the ASME Code.

The Core Spray piping bracket-to-vessel attachment weld is used as an example for comparison between the Code and BWRVIP examination requirements as discussed below.

Comparison to BWRVIP Requirements - Core Spray Piping Bracket Welds (BWRVIP-48-A)

- The Code examination requirement is a VT-3 examination of each weld every 10 years.
- The BWRVIP examination requirement is an EVT-1 for the core spray piping bracket attachment welds with each weld examined every four cycles (8 years for units with a two year fuel cycle).

The BWRVIP examination method EVT-1 has superior flaw detection and sizing capability, the examination frequency is greater than the Code requirements, and the same flaw evaluation criteria are used.

The Code VT-3 examination is conducted to detect component structural integrity by ensuring the components general condition is acceptable. An enhanced EVT-1 is conducted to detect discontinuities and imperfections on the examination surfaces, including such conditions as tight cracks caused by IGSCC or fatigue, the relevant degradation mechanisms for BWR internal attachments.

Therefore, with the EVT-1 examination method, the same examination scope (accessible welds), an increased examination frequency (8 years instead of 10 years) in some cases, the same flaw evaluation criteria (ASME Code Section XI), the level of quality and safety provided by the BWRVIP criteria is superior to that provided by the ASME Code.

4. Code Requirement - B13.40 - Integrally Welded Core Support Structures (B-N-2)

The ASME Code requires a VT-3 examination of accessible surfaces of the welded core support structure each 10-year interval. In the boiling water reactor, the welded core support structure has primarily been considered the shroud support structure, including the shroud support plate (annulus floor), the shroud support ring, the shroud support welds, and the shroud support legs and gussets (if accessible). In later designs, the shroud itself is considered part of the welded core support structure. Historically, this requirement has been interpreted and satisfied differently across the industry. The proposed alternate examination replaces this ASME requirement with specific BWRVIP-38 guidelines that examine susceptible locations for known relevant degradation mechanisms.

Comparison to BWRVIP Requirements - BWR Shroud Support (BWRVIP-38)

- The Code requires a VT-3 of accessible surfaces each 10-year interval.
- The BWRVIP requires either an enhanced visual examination technique (EVT-1) or volumetric examination (UT).

BWRVIP recommended examinations of integrally welded core support structures are focused on the known susceptible areas of this structure, including the welds and associated weld heat affected zones. In many locations, the BWRVIP guidelines require a volumetric examination of the susceptible welds at a frequency identical to the Code requirement.

For other integrally welded core support structure components, the BWRVIP requires an EVT-1 or UT of core support structures. The core shroud is used as an example for comparison between the Code and BWRVIP examination requirements as shown below.

Comparison to BWRVIP Requirements - BWR Core Shroud Examination and Flaw Evaluation Guideline (BWRVIP-76, Rev 1)

- The Code requires a VT-3 examination of accessible surfaces every 10 years.
- The BWRVIP requires an EVT-1 examination from the inside and outside surface where accessible or ultrasonic examination of each core shroud circumferential weld that has not been structurally replaced with a shroud repair at a calculated "end of interval" (EOI) that will vary depending upon the amount of flaws present, but not to exceed ten years.

The BWRVIP recommended examinations specify locations that are known to be vulnerable to BWR relevant degradation mechanisms rather than "accessible surfaces." The BWRVIP examination methods (EVT-1 or UT) are superior to the

Code required VT-3 for flaw detection and characterization. The BWRVIP examination frequency is equivalent to or more frequent than the examination frequency required by the Code. The superior flaw detection and characterization capability, with an equivalent or more frequent examination frequency and the comparable flaw evaluation criteria, results in the BWRVIP criteria providing a level of quality and safety equivalent to or superior to that provided by the ASME Code.

ATTACHMENT 3 TO
RBG-47362
ENERGY FACILITIES REACTOR VESSEL INTERNAL INSPECTION HISTORIES
RBS-ISI-019

Core Shroud	1994	VT-1 / VT-3	Partial inspection during forced outage. Welds H-3 thru H-7, Limited vertical weld inspection. No indications.
	1996	VT-3	ASME XI inspection of accessible areas including the grid. No indications.
	1997 (RF07)	UT	UT from OD. Welds H3, H4, H6A, H7. No indications.
	Oct 2004 (RF12)	UT	UT From OD. Welds H6A and H7. No indications.
	Jan 2008 (RF14)	UT	H3 - 76.6% inspected. No indications. H4 - 92.7% inspected. Indications - 9% weld flawed.
	Feb 2011 (RF16)	UT	H6a and H7. No indications.
Shroud Support	1994	VT-1 / VT-3	Inspection of accessible areas during forced outage. Access Hole Cover; VT. No indications.
	1996	VT-3	Access Hole Cover. No indications.
	1999 (RF08)	VT-1	Access Hole Cover. No indications.
	2000 (RF09)	EVT-1	Shroud Support to Shroud. No Indications. Support Plate to Shroud. No indications.
	Oct. 2001 (RF10)	VT-1	Access Hole Cover. No indications.
	Oct. 2004 (RF12)	VT-1 / UT	Access Hole Cover. No indications. UT From Bio-shield wall H8 & H9. No indications.
	Jan. 2008 (RF14)	VT-1	Access Hole Cover. NRI.
	Feb. 2011 (RF16)	EVT-1	Access Hole Cover. No indications.
Core Spray Piping	1987 to 1997	VT-1 / VT-3	Piping and welds in annulus, every other cycle, starting 1994 every cycle. No indications.
	1997 (RF07)	EVT-1/ MVT-1	BWRVIP-018 (Baseline Inspection). No indications.
	APR 1999 (RF08)	EVT-1 /MVT-1	BWR VIP-018. No Indications.
	March 2000 (RF09)	EVT-1/ MVT-1	BWR VIP-018. No Indications.
	Oct 2001 (RF10)	UT	12 welds examined. No Indications.
	March 2003 (RF11)	EVT-1	17 welds examined. No Indications.
	Oct 2004 (RF12)	UT	8 welds examined. No indications.
	April 2006 (RF13)	EVT-1	8 welds examined. No indications.
	Jan 2008 (RF14)	EVT-1	8 piping welds and 4 brackets examined. No indications.
	Oct 2009 (RF15)	EVT-1	20 welds examined. No indications.
	Jan 2011 (RF16)	EVT-1	8 welds examined. No indications.
	Feb 2013 (RF17)	EVT-1	18 welds examined. No indications.
Core Spray Sparger	1987-1997	VT-1 / VT-3	Nozzles, end caps, support (guides), every other outage. Selected Tee (welds) every other outage. All tee (welds), end caps and nozzles each outage starting 1996.
	1997 (RF07)	EVT-1/MVT-1	BWRVIP-018 (Baseline Inspection). No indications.
	APR 1999 (RF08)	EVT-1/MVT-1	BWRVIP-018. No Indications.

	March 2000 (RF09)	EVT-1/MVT-1	BWRVIP-018. No Indications.
	Oct 2001 (RF10)	EVT-1/VT-1	BWRVIP-018. No Indications.
	March 2003 (RF11)	EVT-1/VT-1	36 welds examined. No indications
	Oct 2004 (RF12)	EVT-1/VT-1	32 items examined. No indications
	April 2006 (RF13)	EVT-1/VT-1	15 items examined. No indications
	Jan 2008 (RF14)	EVT-1/VT-1	42 items examined. Includes spare brackets pin/pads and pads only – one indication identified on alignment pin.
	Oct 2009 (RF15)	EVT-1/VT-1	28 items examined. One of two tack welds cracked on alignment pin @ the 276 AZ annulus side.
	Feb 2011 (RF16)	EVT-1/VT-1	34 items examined. No indications.
	Feb 2013 (RF17)	EVT-1/ VT-1	10 items examined. No indications.
Top Guide (Rim, etc.)	1987 to 1997	VT-3	100% per Interval (Hold down studs, nuts and keeper). No indications.
	Jan 2008 (RF14)	VT-3	ASME examination – no indications
Core Plate (Rim, etc.)	Jan 2008 (RF14)	VT-3	8 exams (Jet Pump disassembled)
SLC	Oct 2004	Enhanced VT-2	VT-2 inspection of N11 nozzle during RPV System Leakage Test. No leakage observed.
	April 2006 (RF13)	Enhanced VT-2	VT-2 inspection of N11 nozzle during RPV System Leakage Test. No leakage observed.
	Jan 2008 (RF14)	Enhanced VT-2	VT-2 inspection of N11 nozzle during RPV System Leakage Test. No leakage observed.
	Oct 2009 (RF15)	Enhanced VT-2	VT-2 inspection of N11 nozzle during RPV System Leakage Test. No leakage observed.
	Feb 2011 (RF16)	Enhanced VT-2	VT-2 inspection of N11 nozzle during RPV System Leakage Test. No leakage observed.
	Mar 2013 (RF17)	Enhanced VT-2	VT-2 inspection of N11 nozzle during RPV System Leakage Test. No leakage observed.
Jet Pump Assembly	1987 to 1997	VT-1/VT-3	Twenty pumps. 1/3 inspected each period first Interval(Diffuser Assembly, Riser Assembly, Riser Braces, inlet suction area, riser brace, wedge assembly, Hold down beam (bolt keeper and tack welds). Wedges, adjusting screws (tack welds), sensing lines receive VT per various SILs. Jet Pump Beams replaced 1994. VT of complete assemblies in 1994 forced outage.
	1997 (RF07)	EVT-1/ MVT-1	Jet Pump Riser Elbow Welds. Jet Pump Riser Brace Welds (6 of 10). No indications.
	1999 (RF08)	EVT-1	Restrainer Assembly (6 of 10) No movement.

	Oct 2001 (RF10)	EVT-1	Riser Pipe to Transition Piece (Limited Access) No indications (5 ea) Inlet elbow to sleeve weld, inlet sleeve to nozzle weld, restrainer bracket wedge, riser pipe of the upper brace and lower brace attachment yoke welds (6 welds inspected).
	March 2003 (RF11)	EVT-1	RB welds: 14 welds examined - JP-11 thru 20. No indications. RS-3 weld: 5 welds examined - JP-11 thru 20. No indications. RS-6 weld: 10 welds examined - JP-11 thru 20. No indications. RS-7 weld: 10 welds examined - JP-11 thru 20. No indications. RS-8 weld: 5 welds examined - JP-11 thru 20. No indications. RS-9 weld: 10 welds examined - JP-1 thru 20. One indication found JP-19/20 riser brace. IN-1/IN-2 weld: 10 welds each examined - JP-11 thru 20. No indications. DF-1, DF-2, DF-3A, DF-3B weld: 10 welds each examined - JP-11 thru JP-20. No indications. AD-2 weld 10: welds examined - JP-11 thru JP-20. No indications. WD-1 weld: 6 welds examined - JP-11, 12, 13, 14, 19 and 20. No indications.
	Oct 2004 (RF12)	EVT-1/VT-1	RS-9: previous crack found in RF11 (Qty 1) & RS-8 (Qty 1) & WD-1 (Qty 1).
	April 2006 (RF13)	EVT-1	RS-9: reinspection of previous crack & RS-8.
	Jan 2008 (RF14)	EVT-1/ VT-1 / UT	JP-19/20 – RS-8 & 9 AD-1, AD-2, DF-3a, b , IN-1 & 2, WD-1, DF-1, 2 (Jet Pump disassembly) JP-1 thru 20 RB-1a, b, c, d. No indications except for previously reported RS-9 indication. 18 Jet Pump Beams (two replaced with new beams).
	Oct 2009 (RF15)	EVT-1/VT-1/VT-3/UT	VT-3 -JP-1 thru 20 sensing lines at welded attachment & penetration. JP 1 thru 10 - 140 welds and 10 expanded scope of the AD-2 welds. AD-2 indication at JP 4, UT was performed at the AD-2 from inside and indication was found non-relevant VT-1 of WD-1 wedges at JP 19/20.
	Jan 2011 (RF16)	EVT-1/VT-1	Examined RS-8 and RS-9 welds as required by OE from Laguna Verde. Qty-30 welds No indications, also examined WD-1 (wedges) on all 20 Jet pumps.
	Feb 2013 (RF17)	UT	UT of group 2 Jet Pump Beams, JP 1 thru 18 – no indications
CRD Guide Housings	March 2003 (RF11)	EVT-1/VT-3	Inspected 15 control rod drive tubes – No indications observed.
	Jan 2008 (RF14)	VT-3	Viewed to the extent possible the CRDHs within view through JP19 & 20 to examine the cap to tube assembly weld (CRDH-1), tube to tube assembly weld (CRDH-4), and tube to reactor pressure vessel weld (CRDH/RPV-1). No indications observed.
In Core	1992 (RF4)	VT-1	No indications

Housing	Feb 2008 (RF14)		Best effort attempt to examine the ICH within view through JP19 & 20 on the in-core housing to reactor pressure vessel weld (ICH/RPV-1). No indications observed.
In Core Dry Tube	1992 (RF4)	VT-3	8 IRM/SRM dry tubes inspected. No indications.
	1996 (RF6)	VT-3	12 IRM/SRM dry tubes inspected. No indications
	1999 (RF8)	VT-1	5 IRM/SRM dry tubes inspected. No indications.
	March 2003 (RF11)	VT-1	IRM/SRM dry tubes QTY 10 inspected No indications.
	Jan 2008 (RF14)	VT-1	Inspected 7 IRM Dry Tubes – 3 with recordable indications Inspected 4 SRM Dry Tubes – 2 with recordable indications.
	Oct 2009 (RF15)	VT-1	Examined Qty-1 IRM and Qty 9 LPRM's No indications. Replaced 5 dry tubes with indications found in RF-14.
	Jan 2011 (RF16)	VT-1	Examined QTY-10 LPRM's no indications. 10 dry tubes were replaced.
	March 2013 (RF17)	VT-1	Inspected 18 dry tubes. Two dry tubes had crack indications and three dry tubes had wear. 4 dry tubes were replaced.
Instrument Penetrations	1994	VT-3	Inspected penetration at vessel during forced outage. No indications noted.
Vessel ID Brackets	1987 to Present	VT-1/VT-3	Section XI inspections once per interval. VT-3, or VT-1 if in bellline region. No indications noted.
	Jan 2008 (RF14)	VT-3/EVT-1	Feedwater brackets, Core Spray brackets, Steam Dryer brackets NRI.
Vessel Interior	Oct 2004 (RF12)	VT-3	Vessel cladding area as required by section XI No indications
	Jan 2008 (RF14)	VT-3	Vessel Cladding - NRI
	Jan 2011 (RF16)	VT-3	Vessel Cladding - NRI
LPCI Coupling	1989, 92	VT-3	Two of three lines in 1989 and two of three lines in 1992. No indications.
	APR 1999 (RF08)	MVT-1	No Indications (1 ea.)
	March 2000 (RF09)	EVT-1	No Indications (2 ea.)
	Oct 2004 (RF12)	EVT-1	9 welds inspected. No indications
	Oct 2009 (RF15)	VT-3	7 welds inspected. No indications
	Feb 2013 (RF17)	EVT-1	8 welds inspected. No indications
Steam Dryer	March 2000 (RF09)	EVT-1	Indications identified CR-RBS-0686
	Oct 2001 (RF10)	EVT-1	Indications less than 4.5 inches
	March 2003 (RF11)	EVT-1	Indications less than 4.5 inches
	Oct 2004 (RF12)	VT-3	Indications less than 4.5 inches
	April 2006 (RF13)	EVT-1	New Indication identified dryer shirt ¾" long Ref. CR-RBS-2006-01770, indications identified in RF9 less than 4.5"
	Jan 2008 (RF14)	VT-1	BWRVIP-139 exam – identified 2 cracks requiring repair. Upper support ring had one indication 5" and another 5.25" long.
	Oct 2009 (RF15)	VT-1	Re-examined indications and repaired welds on upper support ring, V-14 and V-27 from RF-14 No change noted.
	Jan 2011 (RF16)	VT-1	Support Ring indications - No change.
	Feb 2013 (RF17)	VT-1	Support Ring indications - No change.

Feedwater Sparger	1997 (RF07)	VT-1	Repair areas, No Indications
	APR 1999 (RF08)	VT-1	Repair areas, No Indications
	March 2000 (RF09)	VT-1	Repair areas, No Indications
	Oct 2001 (RF10)	VT-1	Repair areas, No Indications
	March 2003 (RF11)	VT-1	Repair areas, No Indications
	Oct 2004 (RF12)	EVT-1	Repair areas, No Indications
	April 2006 (RF13)	EVT-1	Repair areas, No Indications
	Jan 2008 (RF14)	EVT-1VT-3	Qty-8 Brackets to vessel and end brackets -End brackets had wear on pins
	Oct 2009 (RF15)	VT-1	Re-inspected Feedwater brackets and the repair areas. No change noted.
	Jan 2011 (RF16)	VT-1	Reinspection of Feedwater end brackets and the repair areas. No change noted also examined Flow Holes no indications noted.
Feb 2013 (RF17)	VT-1	Reinspection of Feedwater end brackets and the repair areas. No change noted.	
SHASM Retaining Pin	March 2003 (RF11)	VT-3	No Wear Noted
	Oct 2004 (RF12)	VT-3	No Wear Noted Qty 12 inspected
	April 2006 (RF13)	VT-3	No Wear Noted Qty 12 inspected
	Jan 2008 (RF14)	VT-3	No Wear Noted Qty 12 inspected
	Oct 2009 (RF15)	VT-3	No Wear Noted Qty 12 inspected
	Jan 2011 (RF16)	VT-3	No Wear Noted Qty 12 inspected
	Feb 2013 (RF17)	VT-3	No Wear Noted Qty 12 inspected
Below Core Plate	Jan 2008 (RF14)	VT-3	QTY 16 items examined NRI.
IGSCC Category "C" DM Welds (containing Alloy 82/182 weld material)	Jan 2008 (RF14)	Automated	Completed qualified ASME Section XI, Appendix VIII, Supplement 10 examinations on: (1) Remaining seventeen welds (2) No Flaws were identified (3) No overlays were required
DM Welds (BWRVIP-75-A)	Oct 2004 (RF12)	UT (PDI)	Inspection: Qty – 10 (N2)
	Feb 2008 (RF14)	UT (PDI)	Inspection: Qty – 17 (N1 Qty-2, N4 Qty-3, N5 Qty-4, N6 Qty-6, N9 Qty-2)
	Feb 2011 (RF16)	UT (PDI)	Inspection: QTY - 2 (N4)

[TYPICAL]

To: Genia Williams
Administrative Services

Transmittal Date: May 16, 2013

From: RBS Licensing/ B. Burmeister / 225-381-4148
Releasing Department / Name / Phone Ext.

Transmittal No.: _____
(if applicable)

NOTE

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Table (ENN)	Document/Official Record Number	Revision/Sequence Number	Description or Title	Official Record Completion or Document Effective Date	Admin Services Indep Verification (initial/date)	Comments
L 02.01	RBG-47362	0	Request for Alternative in Accordance with 10 CFR 50.55a(a)(3)(i) Use of Boiling Water Reactor Vessel and Internals Project (BWRVIP) Guidelines in Lieu of Specific ASME Code Requirements			Correspondence

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