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10 CFR 50.55a

April 10, 2015

U.S. Nuclear Regulatory Commission ATTN: Document Control Desk Washington, DC 20555-0001

> Clinton Power Station, Unit 1 Facility Operating License No. NPF-62 NRC Docket No. 50-461

Nine Mile Point Nuclear Station, Units 1 and 2 Renewed Facility Operating License Nos. DPR-63 and NPF-69 NRC Docket Nos. 50-220 and 50-410

Subject: Submittal of Relief Requests I3R-10, 1ISI-004, and 2ISI-013 Concerning Use of the BWRVIP Guidelines in Lieu of Specific ASME Code Requirements

Attached for your review is are relief requests I3R-10, 1ISI-004, and 2ISI-013 associated with the Clinton Power Station, Unit 1, and the Nine Mile Point Nuclear Station, Units 1 and 2, respectively. This relief request proposes to utilize BWRVIP guidelines in lieu of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code requirements. We request your approval by April 10, 2016. Attachment 1 contains these relief requests.

No commitments are contained in this letter.

If you have any questions concerning this letter, please contact Tom Loomis at (610) 765-5510.

Respectfully,

David T. Gudger Manager - Licensing & Regulatory Affairs Exelon Generation Company, LLC

Attachments: 1) Relief Requests I3R-10, 1ISI-004, and 2ISI-013

- 2) Comparison of Code Examination Requirements to BWRVIP Examination Requirements
- cc: Regional Administrator, Region I, USNRC Regional Administrator, Region III, USNRC USNRC Senior Resident Inspector, Nine Mile Point, Clinton Power Station USNRC Project Manager, Nine Mile Point, Clinton Power Station

Attachment 1

Relief Requests I3R-10, 1ISI-004, and 2ISI-013

Request for Relief for Use of the BWRVIP Guidelines in Lieu of Specific ASME Code Requirements on Reactor Pressure Vessel Internals and Components Inspection In Accordance with 10 CFR 50.55a(z)(1)

1. ASME Code Component(s) Affected:

Code Class:	1
Reference:	IWB-2500
	Table IWB-2500-1
Examination Category:	B-N-1 and B-N-2
Item Number:	B13.10, B13.20, B13.30, and B13.40
Description:	Use of BWRVIP Guidelines in Lieu of Specific ASME Code
	Requirements on Reactor Pressure Vessel Internals and
	Components Inspection
Component Name:	Vessel Interior, Interior Attachments within Beltline Region,
	Interior Attachments beyond Beltline Region, and Core
	Support Structure

2. Applicable Code Edition and Addenda:

Station	Interval	ASME Section XI Code Year and Addenda	Interval Start Date	Interval End Date
Clinton Power Station, Unit 1	Third	2004 Edition	July 1, 2010	June 30, 2020
Nine Mile Point Nuclear Station, Unit 1	Fourth	2004 Edition	August 23, 2009	August 22, 2019
Nine Mile Point Nuclear Station, Unit 2	Third	2004 Edition	April 5, 2008	April 4, 2018

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, Categories B-N-1 and B-N-2 and identified with the following item numbers:

- B13.10 Examine accessible areas of the reactor vessel interior each period by the VT-3 visual examination method (B-N-1).
- B13.20 Examine interior attachment welds within the beltline region each interval by the VT-1 visual examination method (B-N-2).

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 2 of 18)

- B13.30 Examine interior attachment welds beyond the beltline region each interval by the VT-3 visual examination method (B-N-2).
- B13.40 Examine accessible surfaces of the welded core support structure each interval by the VT-3 visual examination 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:

Pursuant to 10 CFR 50.55a(z)(1), relief is requested for the proposed alternative to the Code requirements provided above on the basis that the use of the 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. I&E guidelines focus on specific and susceptible components, specify appropriate inspection methods capable of identifying 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.

5. Proposed Alternative and Basis for Use:

In lieu of the requirements of ASME Section XI, the proposed alternative is detailed in Table 1 for Clinton Power Station, Unit 1 and Table 2 for Nine Mile Point Nuclear Station (NMP), Units 1 and 2 for Examination Categories B-N-1 and B-N-2.

The stations will satisfy the Examination Category B-N-1 and B-N-2 requirements as described in Tables 1 and 2 in accordance with BWRVIP guideline requirements. This relief request proposes to utilize the associated BWRVIP guidelines in lieu of the associated Code requirements including but not limited to exam method, volume, frequency, training, successive and additional examinations, flaw evaluations, and reporting.

Not all the components addressed by these guidelines are code components. The following guidelines are applicable to this Relief Request:

- BWRVIP-03, BWR Vessel and Internals Project, Reactor Pressure Vessel and Internals Examination Guidelines
- BWRVIP-18, Revision 1-A, 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

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 3 of 18)

- BWRVIP-27-A, BWR Standby Liquid Control System/Core Plate △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 System (LPCI) Coupling 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, Revision 1, BWR Core Shroud Inspection and Flaw Evaluation Guidelines
- BWRVIP-94, Revision 2, BWR Vessel and Internals Project Program Implementation Guide
- BWRVIP-138, Revision 1-A, Updated Jet Pump Beam Inspection and Flaw Evaluation Guidelines
- BWRVIP-180, Access Hole Cover Inspection and Flaw Evaluation Guidelines
- BWRVIP-183, Top Guide Grid Beam Inspection and Flaw Evaluation Guidelines

Tables 1 and 2 compare present ASME Examination Category B-N-1 and B-N-2 requirements with the above current BWRVIP guideline requirements. Clinton Power Station, Unit 1 is a BWR/6 design, Nine Mile Point Nuclear Station, Unit 1 is a BWR/2 design and Nine Mile Point Nuclear Station, Unit 2 is a BWR/5 design.

Inspection services, by an Authorized Inspection Agency, will be applied to the proposed alternative actions of this relief request.

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. 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. Table 3 provides summary information for a current deviation applicable to this relief request. The NRC has agreed with the BWRVIP approach in principal and is expected to issue Safety Evaluations for many of these BWRVIP guidelines. Therefore, use of these guidelines, as an alternative to the subject Code requirements, provides an acceptable level of quality and safety and will not adversely impact the health and safety of the public.

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 Item Numbers B13.10, B13.20, B13.30, and B13.40 in Table IWB-2500-1, 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. These comparisons demonstrate that use of these guidelines, as an alternative to the subject Code requirements, provides an acceptable level of quality and safety and will not adversely impact the health and safety of the public.

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 4 of 18)

The BWRVIP provides BWR Vessel and Internals Inspection Summaries to the NRC periodically. The Table below contains the BWR Vessel and Internals Inspection Summaries transmitted to the NRC that includes Clinton Power Station, Unit 1 and Nine Mile Point Nuclear Station, Unit 1 and Unit 2. These summaries provide, on a component-by-component basis, the inspection methods utilized, the inspection dates, and the results of the inspections. These summaries also contain the identified corrective actions. This information reflects the compilation of the BWRVIP outage reports. Corrective actions and inspections performed prior to the BWRVIP were implemented to the requirements of ASME Section XI, as applicable.

Unit	Accession number	Document title	Document date
Clinton Power Station, Unit 1	ML14241A014	Project No. 704 – BWR Vessel and Internals Inspection Summaries for Fall 2013 Outages	08/07/2014
Nine Mile Point Nuclear Station, Unit 1	ML14125A303	Project No. 704 – BWR Vessel and Internals Inspection Summaries for Spring 2013 Outages	04/11/2014
Nine Mile Point Nuclear Station, Unit 2*	ML13176A003	Project No. 704 - BWR Vessel and Internals Inspection Summaries for Spring 2012 Outages	06/19/2013

* Note the BWR Vessel and Internals Inspection Summary that includes the latest Nine Mile Point Nuclear Station, Unit 2 outage in spring 2014 has not been assembled and transmitted to the NRC by the BWRVIP.

The reactor vessel internals inspection programs at Clinton Power Station, Unit 1 and Nine Mile Point Nuclear Station, Units 1 and 2 have been developed and implemented to satisfy the requirements of BWRVIP-94. It is recognized that the BWRVIP executive committee periodically revises the BWRVIP guidelines to include enhancements in inspection techniques and flaw evaluation methodologies. Where the revised version of a BWRVIP inspection guideline continues to meet or exceed 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 relief has been approved.

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 5 of 18)

6. Duration of Proposed Alternative:

This relief request is applicable through the end of the current intervals for the sites identified in Section 2 of this relief request.

7. <u>Precedents:</u>

Similar relief requests have been approved in References 15 through 19.

8. <u>References:</u>

- 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)
- 2. Letter from NRC to BWRVIP, "Final Safety Evaluation of BWRVIP Vessel and Internals Project, "BWR Vessel and Internals Project, BWR Core Plate Inspection and Flaw Evaluation Guideline (BWRVIP-25)," EPRI Report TR-107284, December 1996 (TAC No. M978020)," dated December 19, 1999
- 3. Letter from NRC to BWRVIP, "NRC Approval Letter of BWRVIP-26-A, "BWR Vessel and Internals Project Boiling Water Reactor Top Guide Inspection and Flaw Evaluation Guidelines"," dated September 9, 2005
- Letter from NRC to BWRVIP, "Propriety Version of NRC Staff Review of BWRVIP-27-A, "BWR Standby Liquid Control System/Core Plate △P Inspection and Flaw Evaluation Guidelines"," dated June 10, 2004
- 5. Letter from NRC to BWRVIP, "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)," dated July 24, 2000
- 6. BWRVIP-41, Revision 3, "BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines"
- 7. BWRVIP-42, Revision 1, "Low Pressure Coolant Injection System (LPCI) Coupling Inspection and Flaw Evaluation Guidelines"
- 8. Letter from NRC to BWRVIP, "NRC Approval Letter of BWRVIP-47-A, "BWR Vessel and Internals Project Boiling Water Reactor Lower Plenum Inspection and Flaw Evaluation Guidelines"," dated September 9, 2005
- 9. Letter from NRC to BWRVIP, "NRC Approval Letter of BWRVIP-48-A, "BWR Vessel and Internals Project Vessel ID Attachment Weld Inspection and Flaw Evaluation Guideline"," dated July 25, 2005

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 6 of 18)

- 10. "BWRVIP-76NP, Revision 1: BWR Vessel and Internals Project BWR Core Shroud Inspection and Flaw Evaluation Guidelines," dated May 2011 (ML11195A182)
- 11. 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 (ML11271A058)
- 12. BWRVIP-138, Revision 1-A, "Updated Jet Pump Beam Inspection and Flaw Evaluation Guidelines"
- 13. BWRVIP-180, "Access Hole Cover Inspection and Flaw Evaluation Guidelines"
- 14. "BWRVIP-183NP: BWR Vessel and Internals Project Top Guide Grid Beam Inspection and Flaw Evaluation Guidelines," dated December 7, 2007 (ML080220433)
- 15. Letter from NRC to Entergy Nuclear Operations, Inc., "Safety Evaluation of Relief Request RI-01, Vermont Yankee Nuclear Power Station (TAC No. MC0690)," dated September 19, 2005 (ML052370244)
- 16. Letter from NRC to Exelon/AmerGen, "Clinton Power Station, Unit No. 1; Dresden Nuclear Power Station, Units 2 and 3; LaSalle County Station, Units 1 and 2; Limerick Generating Station, Units 1 and 2; Oyster Creek Nuclear Generating Station; Peach Bottom Atomic Power Station, Units 2 and 3; and Quad Cities Nuclear Power Station, Units 1 and 2 – Relief Request to Use Boiling Water Reactor Vessel and Internals Project Guidelines in Lieu of Specific ASME Code Requirements (TAC Nos. MD5352 through MD5363)," dated April 30, 2008 (ML080980311)
- 17. Letter from NRC to Exelon Nuclear, "Oyster Creek Nuclear Generating Station -Relief From the Requirements of the ASME Code, Relief Request No. I5R-01 (TAC No. ME9490)," dated August 5, 2013 (ML13169A062)
- Letter from NRC to Entergy Operations, Inc., "River Bend Station, Unit 1 Request for Relief No. RBS-ISI-019, Alternative to Use Boiling Water Vessel and Internals Project Guidelines in Lieu of ASME Code, Section XI Requirements for the Fourth 10-Year Inservice Inspection Interval (TAC No. MF1867)," dated May 30, 2014 (ML14127A327)
- 19. Letter from NRC to Entergy Operations, Inc., "Grand Gulf Nuclear Station, Unit 1 – Request for Relief GG-ISI-017, Alternative to Use Boiling Water Reactor Vessel and Internals Project Guidelines in Lieu of Specific ASME Code Requirements (TAC No. MF2357)," dated June 30, 2014 (ML14148A262)

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 7 of 18)

Clipton Po	wer Station Compariso	n of ASME Exam	nination Cat	TABLE 1 egory B-N-1 and	B-N-2 Requireme	ents With BWR	/IP Guidance Re	equirements ⁽¹⁾
ASME Item Number, Table	Component	ASME Exam Scope	ASME Exam	ASME Frequency	Applicable BWRVIP Document	BWRVIP Exam Scope	BWRVIP Exam	BWRVIP Frequency
B13.10	Reactor Vessel Interior	Accessible Areas	VT-3	Each period	BWRVIP-18, 26, 27, 38, 41, 42, 47, 48, 76, and 180	Overview ex BWRVIP exa VT-3	caminations of co aminations meet 3 inspection requ	mponents during the intent of Code irements.
B13.20	Interior Attachments Within Beltline – Jet Pump Riser Braces	Accessible Welds	VT-1	Each 10-year Interval	BWRVIP-48, Table 3-2	Riser Brace Attachment	EVT-1	25% during each 6 years
	Lower Surveillance Specimen Holder Brackets				BWRVIP-48, 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, Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval
	Guide Rod Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval
	Steam Dryer Support Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	EVT-1	Each 10-year Interval
	Feedwater Sparger Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	EVT-1	Each 10-year Interval
	Core Spray Piping Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	EVT-1	Every four refueling cycles
	Upper Surveillance Specimen Holder Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval
	Shroud Support Welds				BWRVIP-38, 3.3, Figure 3-5	Weld H9	EVT-1 or UT	Maximum of 6 years for one- sided EVT-1, Maximum of 10 years for UT

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 8 of 18)

TABLE 1 Clinton Power Station Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements ⁽¹⁾								
ASME Item Number, Table IWB-2500-1	Component	ASME Exam Scope	ASME Exam	ASME Frequency	Applicable BWRVIP Document	BWRVIP Exam Scope	BWRVIP Exam	BWRVIP Frequency
B13.30	Shroud Support Leg Weld H12	Accessible Welds (Beneath core plate; rarely accessible)	VT-3	Each 10- year Interval	BWRVIP-38, 3.2.3	Weld H12	Per BWRVIP-38 NRC SE (7/24/00), inspect with appropriate method ⁽²⁾	When accessible
B13.40	Core Support Structure - Shroud Support	Accessible Surfaces	VT-3	Each 10-year Interval	BWRVIP-38, 3.3, Figures 3-4 and 3-5	Shroud Support (H8 and H9)	EVT-1 or UT	Based on as found conditions, to a maximum 6 years for one-sided EVT-1, 10 years for UT where accessible
	Shroud Support Legs	Accessible Surfaces (beneath core plate; rarely accessible)			BWRVIP-38, 3.2.3	Shroud support leg welds	Per BWRVIP-38 NRC SE (7/24/00), inspect with appropriate method ⁽²⁾	When accessible
	Shroud Vertical Welds	Accessible Surfaces			BWRVIP-76, 3.3, Figure 3-2	Vertical Welds	EVT-1 or UT	Maximum 6 years for one-sided EVT-1, 10 years for UT
	Shroud Repairs ⁽³⁾				BWRVIP-76, Section 3.5	Tie-Rod Repair	VT-3	Per designer recommendations per BWRVIP-76

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 9 of 18)

NOTES TO TABLE 1:

- 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) When inspection tooling and methodologies are available, they will be utilized to establish a baseline inspection of these welds.
- 3) Shroud repairs are currently installed on the Clinton Power Station.

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 10 of 18)

TABLE 2 Nine Mile Point Nuclear Station Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements ⁽¹⁾									
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	Accessible Areas	VT-3	Each period	BWRVIP-18, 26, 27, 38, 41, 42, 47, 48, 76, and 180	Overview examinations of components during BWRVIP examinations meet the intent of Code VT-3 inspection requirements.			
B13.20	Interior Attachments Within Beltline – Jet Pump Riser Braces	Accessible Welds	VT-1	Each 10- year Interval	BWRVIP-48, Table 3-2	Riser Brace Attachment	EVT-1	25% during each 6 years	
	Lower Surveillance Specimen Holder Brackets				BWRVIP-48, 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, Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval	
	Guide Rod Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval	
	Steam Dryer Support Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	EVT-1	Each 10-year Interval	
	Feedwater Sparger Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	EVT-1	Each 10-year Interval	
	Core Spray Piping Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	EVT-1	Every 4 refueling cycles	
	Upper Surveillance Specimen Holder Brackets				BWRVIP-48, Table 3-2	Bracket Attachment	VT-3	Each 10-year Interval	
	Shroud Support Welds				BWRVIP-38, 3.3, Figure 3-5	Weld H9 ⁽³⁾	EVT-1 or UT	Maximum of 6 years for EVT-1, Maximum of 10 years for UT	
B13.30	Shroud Support Leg Weld H12	Accessible Welds (Beneath core plate; rarely accessible)	VT-3	Each 10- year Interval	BWRVIP-38, 3.2.3	Weld H12	Per BWRVIP-38 NRC SE (7/24/00), inspect with appropriate method ⁽⁴⁾	When accessible	

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 11 of 18)

Nine M	ile Point Nuclear Station	Comparison of A	SME Exam	ination Catego	TABLE 2 ory B-N-1 and B-N	-2 Requirements	With BWRVIP Guid	ance Requirements ⁽¹⁾
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	Core Support Structure - Shroud Support ⁽²⁾	Accessible Surfaces	VT-3	Each 10-year Interval	BWRVIP-38, 3.3, Appendix A Figures 3-4 and 3-5	Welds H8 and H9 ⁽³⁾	EVT-1 or UT	Based on as-found conditions, to a maximum 6 years for EVT-1, 10 years for UT
	Shroud Support Legs (NMP2 only)	Accessible Surfaces (beneath core plate; rarely accessible)			BWRVIP-38, 3.2.3	Shroud support leg welds	Per BWRVIP-38 NRC SE (7/24/00), inspect with appropriate method ⁽⁴⁾	When accessible
	Shroud Horizontal Welds (NMP2 only)	Accessible Surfaces			BWRVIP-76, 2.2, Figure 2-3	Welds H1 – H7 as applicable	EVT-1 or UT	Based on as-found conditions, to a maximum 6 years for one sided EVT-1, 10 years for UT
	Shroud Vertical Welds				BWRVIP-76, 2.3, 3.3, Figures 2-4, 2- 5, and 3-2	Vertical and Ring Segment Welds	EVT-1 or UT	Maximum 6 years for one-sided EVT-1; 10 years for UT
	Shroud Repairs ⁽⁵⁾	Accessible Surfaces			BWRVIP-76, 3.5, 3.6	Tie-Rod Repair	VT-3	Per repair designer recommendations, per BWRVIP-76

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 12 of 18)

NOTES TO TABLE 2:

- 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) NMP1 is a BWR/2 design and has a conical shroud support plate. The NMP2 design is a shroud support plate with legs.
- 3) The NMP1 evaluation in Appendix A of BWRVIP-38 identifies the inspection scope based on inspection frequency. H9 inspection evaluation and frequency was previously accepted by the NRC in a letter dated October 31, 2001 (Accession Number ML012990403).
- 4) When inspection tooling and methodologies are available, they will be utilized to establish a baseline inspection of these welds.
- 5) NMP1 has a tie rod shroud repair. NMP2 does not have a shroud repair.

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 1 Revision 0 (Page 13 of 18)

TABLE 3 BWRVIP Deviations

<u>PLANT</u>	BWRVIP DOCUMENT	LETTER DATE TO USNRC	DEVIATION	APPLICABILITY
Nine Mile Point Nuclear Station, Unit 2	BWRVIP-25	Letter from Joseph E. Pacher (Constellation Energy, LLC) to U.S. Nuclear Regulatory Commission, dated March 30, 2011	BWRVIP-25 requires ultrasonic or visual examination of the core plate bolts. There are currently no examination methods available for these bolts and is being addressed as a BWRVIP generic issue. Analytical evaluation has been completed to support operation.	This deviation does not impact the basis for use of this relief request.

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 2 Revision 0 (Page 14 of 18)

Comparison of Code Examination Requirements to BWRVIP Examination Requirements

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 2 Revision 0 (Page 15 of 18)

The following discussion provides a comparison of the examination requirements provided in ASME Code Item Numbers B13.10, B13.20, B13.30, and B13.40 in Table IWB-2500-1, to the examination requirements in the 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 visual 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 inspection period during each successive ten-year ISI inspection interval. Typically, these examinations are performed every Inspection Period of the inspection interval. This examination requirement is a non-specific requirement that is a departure from the traditional ASME 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 examination. Examination of core spray piping and spargers (BWRVIP-18), top guide (BWRVIP-26), jet pump welds and components (BWRVIP-41), LPCI couplings (BWRVIP-42), lower plenum components (BWRVIP-47) interior attachments (BWRVIP-48), core shroud welds (BWRVIP-76), and shroud support (BWRVIP-38) 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 for visual examination of these areas or spaces as the specific weld or components 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 - B13.20 - 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.

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 2 Revision 0 (Page 16 of 18)

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

- 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.
- BWRVIP-41 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 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 Section XI Code 2004 Edition, VT-1 visual examination method requires 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 visual examination of accessible reactor interior surface attachment welds beyond the beltline each 10-year interval. This includes the upper surveillance specimen support bracket welds-to-vessel wall, the core spray piping primary and supplemental support bracket welds-to-vessel wall, the feedwater sparger support bracket welds-to-vessel wall, the steam dryer support welds-to-vessel wall, the guide rod support bracket weld-to-vessel wall, core spray piping brackets, and the shroud support plate-to-vessel weld. BWRVIP-48 requires as a minimum the same VT-3 visual 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 visual 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 provided by the ASME Code.

For 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

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 2 Revision 0 (Page 17 of 18)

require an EVT-1 visual examination at least as frequent as the Code. Therefore, the BWRVIP requirements provide the same level of quality and safety as that provided by the ASME Code. The feedwater sparger 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 - Feedwater Sparger Bracket Welds (BWRVIP-48)

- The Code examination requirement is a VT-3 visual examination of each weld every 10 years.
- The BWRVIP visual examination requirement is an EVT-1 for the feedwater sparger bracket attachment welds with each weld examined every 10 years.

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

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

Therefore, with the EVT-1 visual examination method, the same examination scope (accessible welds), the same examination frequency, and the same flaw evaluation criteria (ASME Section XI), the level of quality and safety required by the BWRVIP criteria is superior to that required by the Code.

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

The ASME Code requires a VT-3 visual examination of accessible surfaces of the welded core support structure each 10-year interval. In the boiling water reactor, the core support structure has primarily been considered the shroud support structure, including the shroud. Historically, this requirement has been interpreted and satisfied differently across the industry. The proposed alternate examination replaces this ASME requirement with specific BWRVIP 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 visual examination of accessible surfaces each 10-year interval.
- The BWRVIP requires an enhanced visual examination technique (EVT-1) or volumetric examination (UT) every 10 years as compared to the Code requirement (VT-3).

BWRVIP recommended examinations of 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.

10 CFR 50.55a RELIEF REQUESTS I3R-10, 1ISI-004, and 2ISI-013 Attachment 2 Revision 0 (Page 18 of 18)

Comparison to BWRVIP Requirements - BWR Shroud (BWRVIP-76)

Shroud repair Tie-Rods have been installed at Clinton Power Station and Nine Mile Point Unit 1. Therefore, BWRVIP-76 requires inspection of the vertical shroud welds and the Tie-Rod repair hardware.

- The Code requires a VT-3 visual examination of accessible surfaces each 10-year interval.
- The BWRVIP requires an enhanced visual examination technique (EVT-1) or volumetric examination (UT) of shroud vertical welds every 10-years minimum, as compared to the Code requirement (VT-3).
- The BWRVIP requires VT-3 and other appropriate techniques to examine the Tie-Rod repair hardware every ten years.

Therefore, the BWRVIP referenced examinations are the same or superior to the Code requirements. Shroud vertical welds and repair Tie-Rod examinations are recommended in BWRVIP-76 and have the same basic VT-3 method of visual examination or better, the same examination frequency (each tenyear interval) and comparable flaw evaluation criteria. Therefore, the BWRVIP requirements provide a level of quality and safety equivalent to that provided by the ASME Code.

For other core support structure components, the BWRVIP requires an EVT-1 visual examination or UT of core support structures.

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 visual examination for flaw detection and characterization. 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 required by the Code requirements.