Xcel Energy®

Monticello Nuclear Generating Plant
2807 W County Road 75
Monticello, MN 55362

November 20, 2015

L-MT-15-083
10 CFR 50.55a(z)(1)

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

Monticello Nuclear Generating Plant
Docket 50-263
Renewed Facility Operating License No. DPR-22

10 CFR 50.55a Request No. RR-010: Request for Approval of an Alternative to Apply the BWRVIP Guidelines in Lieu of Specific ASME Section XI Code Requirements for Reactor Pressure Vessel Internals and Components Inspection

Pursuant to 10 CFR 50.55a, "Codes and Standards," the Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, requests in accordance with subparagraph 10 CFR 50.55a(z)(1) application of an alternative to the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Specifically, it is requested to use the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines in lieu of specific ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," requirements. This request is made on the basis that the proposed alternative provides an acceptable level of quality and safety for the examination of reactor vessel internals.

Enclosure 1 provides the 10 CFR 50.55a(z)(1) request to apply for an alternative. Attachment 1 to Enclosure 1 provides a table comparing the specific Monticello Nuclear Generating Plant (MNGP) ASME Section XI Code examination requirements with BWRVIP examination requirements. Attachment 2 to Enclosure 1 provides a discussion comparing some ASME Section XI Code examination requirements with BWRVIP examination requirements.

NSPM requests approval for this 10 CFR 50.55a alternative by November 20, 2016.

Summary of Commitments

This letter does not propose any new commitments and does not revise any existing commitments.

If you have any questions or require additional information, please contact Mr. Richard Loeffler at (763) 295-1247.

Peter A. Gardner
Site Vice President, Monticello Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosures:

Enclosure 1: 10 CFR 50.55a Request No. RR-010: Request for Approval of an Alternative to Apply the BWRVIP Guidelines in Lieu of Specific ASME Section XI Code Requirements for Reactor Pressure Vessel Internals and Components Inspection

Attachment 1: Table 1: MNGP Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements

Attachment 2: Comparison of ASME Code Section XI Examination Requirements to BWRVIP Examination Requirements

cc: NRC Regional Administrator, Region III, USNRC
NRR Project Manager, Monticello, USNRC
NRC Resident Inspector, Monticello, USNRC
Minnesota Department of Commerce

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Enclosure 1

10 CFR 50.55a Request No. RR-010

Request for Approval of an Alternative to Apply the BWRVIP Guidelines in Lieu of Specific ASME Section XI Code Requirements for Reactor Pressure Vessel Internals and Components Inspection

A. ASME SECTION XI CODE COMPONENTS AFFECTED:

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

B. APPLICABLE ASME SECTION XI CODE EDITION AND ADDENDA

The applicable American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel, Section XI Code for the Monticello Nuclear Generating Plant (MNGP), for the Fifth 10-Year Inservice Inspection (ISI) Program interval is the 2007 Edition through 2008 Addenda. The Fifth 10-Year interval began on September 1, 2012, and will end on May 31, 2022.

C. APPLICABLE ASME SECTION XI CODE REQUIREMENT

ASME Section XI requires the examination of components within the reactor pressure vessel. These examinations are included under Section XI, Subarticle IWB-2500, Table IWB-2500-1, Categories B-N-1 and B-N-2 and are 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).

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.

D. REASON FOR REQUEST

Inspections of the MNGP reactor pressure vessel (RPV) internals and components are currently performed in accordance with both Section XI of the ASME Code and the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines. The Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, requests approval of a 10 CFR 50.55a alternative to utilize the BWRVIP guidelines in lieu of Section XI of the ASME Code for performance of RPV internals and component inspections.

This alternative to ASME Section XI Code requirements is requested in accordance with 10 CFR 50.55a(z)(1) on the basis that use of the BWRVIP guidelines discussed below provides an acceptable level of quality and safety.

The BWRVIP Inspection and Evaluation guidelines have recommended specific inspections by Boiling Water Reactor (BWR) plant 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 Inspection and Evaluation 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 in accordance with 10 CFR 50.55a(z)(1) provides comparable inspections and maintains an adequate level of quality and safety and avoids unnecessary inspections. Additionally, avoidance of unnecessary inspections reduces personnel radiation dose and contributes to maintaining dose to workers As-Low-As-Reasonably-Achievable (ALARA).

E. PROPOSED ALTERNATIVE AND BASIS FOR USE

E.1 Proposed Alternative

The proposed alternative is to apply the applicable BWRVIP guidelines in lieu of the ASME Section XI Code requirements for the items listed in Table 1, "MNGP Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements" (Attachment 1 to this enclosure). This request for an alternative proposes to utilize the identified BWRVIP guidelines in lieu of the associated Section XI ASME Code requirements includes, but is not limited to; the exam method, volume, frequency, training, successive and additional examinations, flaw evaluations, and reporting.

The BWRVIP Inspection and Evaluation (I&E) guidelines that are applicable to this proposed 10 CFR 50.55a alternative for the MNGP are listed below. Note, that some of the BWRVIP guidelines commonly applied for by other licensees do not pertain to the MNGP based on differences in plant configuration,[1][2] or due to previous approved alternatives[3][4] for the MNGP (References 1, 2 and 3).

- BWRVIP-03, Revision 17: Reactor Pressure Vessel and Internals Examination Guidelines (Reference 4)
- BWRVIP-18, Revision 1-A: BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines (Reference 5)
- BWRVIP-25: BWR Core Plate Inspection and Flaw Evaluation Guidelines (Reference 6)[4]
- BWRVIP-26-A: BWR Top Guide Inspection and Flaw Evaluation Guidelines (Reference 7)
- BWRVIP-27-A: BWR Standby Liquid Control System/Core Plate ΔP Inspection and Flaw Evaluation Guidelines (Reference 8)
- BWRVIP-38: BWR Shroud Support Inspection and Flaw Evaluation Guidelines (Reference 9)

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1. BWRVIP-42, Revision 1: Low Pressure Coolant Injection System (LPCI) Coupling Inspection and Flaw Evaluation Guidelines, is not applicable because LPCI does not inject into the core shroud in a BWR/3.
2. BWRVIP-139-A: Steam Dryer Inspection and Flaw Evaluation Guidelines (Reference 3), is not applicable because the MNGP has installed a replacement Westinghouse Steam Dryer.
3. In Reference 1 the NRC approved an alternative to the ASME Section XI examination requirements for the RPV Shroud Support Plate Welds H8 and H9 for the Fifth 10-Year Inservice Inspection Program Interval.
4. The inspection guidance of BWRVIP-25: BWR Core Plate Inspection and Flaw Evaluation Guidelines, is not applicable since in Reference 2, NUREG-1865 (Safety Evaluation Report for the MNGP license renewal), Section 4.8, "Stress Relaxation of Rim Holddown Bolts," an analysis was approved for MNGP. However, BWRVIP-25 is included for potential, future applicability.

- BWRVIP-41, Revision 3: BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines (Reference 10)[5]
- BWRVIP-47-A: BWR Lower Plenum Inspection and Flaw Evaluation Guidelines (Reference 11)[5]
- BWRVIP-48-A: Vessel ID [Inside Diameter] Attachment Weld Inspection and Flaw Evaluation Guidelines (Reference 12)
- BWRVIP-76, Revision 1-A: BWR Core Shroud Inspection and Flaw Evaluation Guidelines (Reference 13)
- BWRVIP-138, Revision 1-A: Updated Jet Pump Beam Inspection and Flaw Evaluation Guidelines (Reference 14)
- BWRVIP-180: Access Hole Cover Inspection and Flaw Evaluation Guidelines (Reference 15)
- BWRVIP-183: Top Guide Grid Beam Inspection and Flaw Evaluation Guidelines (Reference 16)

Also, the following BWRVIP guideline discusses the overall program implementation.

- BWRVIP-94NP, Revision 2: BWR Vessel and Internals Project Program Implementation Guide (Reference 17)

Table 1, "MNGP Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements," (Attachment 1 to this enclosure) compares the current ASME Section XI Code examination category requirements with the current BWRVIP guideline requirements, as applicable to the MNGP.[6]

The MNGP reactor vessel internals inspection program has been developed and implemented to satisfy the requirements of the BWRVIP Program Implementation Guide (BWRVIP-94NP, Revision 2). NSPM is an active member of the BWRVIP and has made the following commitment, documented in Appendix K of the MNGP Updated Safety Analysis Report (USAR), as part of the MNGP License Renewal.

> The NSPM is an active member of the BWRVIP and will continue to follow applicable inspection guidelines and recommendations, which have been

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5. NUREG-1865 (Reference 2), Subsection 3.0.3.1.8, "Thermal Aging & Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program," summarizes the inspection of MNGP CASS components. For the purpose of condition monitoring the inspection schedule is managed in accordance with the guidance for B-N-1 and B-N-2 components under ASME Section XI. However, none of the components are B-N-1 or B-N-2 components as defined by ASME Section XI and are outside of the scope of this 10 CFR 50.55a(z)(1) request for an alternative.
6. This request applies only to those components included within the BWRVIP guidelines that are ASME Examination Category B-N-1 and B-N-2 components.

reviewed and approved by the executive committee of the BWRVIP, throughout the period of extended operation for MNGP.

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 MNGP program.

Therefore, where a 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 an alternative has been approved. Table 1 represents the most current MNGP comparison with the BWRVIP guidance.

BWRVIP member utilities are required to periodically assess the rigor and degree of adherence of their reactor vessel internals program to the BWRVIP guidance through the use of third party assessments by industry experts.[7]

The BWRVIP guidelines do not indicate that use of an Authorized Inspection Agency (AIA) or an Authorized Nuclear Inservice Inspector (ANII) is required. The NRC Safety Evaluations for the BWRVIP guidelines (those approved by the NRC), also do not indicate that use of an AIA or ANII is required. Consistent with the current implementation of the BWRVIP guidelines, NSPM proposes to implement the BWRVIP program and applicable guidelines for the requested alternative without use of an AIA, as specified by ASME Section XI, for reactor vessel internal (RVI) components in Table 1 for Category B-N-1 and B-N-2.

If, however, examinations performed under the proposed alternative identify relevant conditions that require evaluation and disposition, NSPM will continue to implement the ASME XI Code provisions to provide evaluation and disposition results to the ANII for review. Additionally, in the event that conditions are identified that require Repair/Replacement (R/R) activities in accordance with

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7. The Institute of Nuclear Power Operations (INPO) is one example of an organization that often performs independent third-party review of a licensee's BWRVIP.

ASME Section XI Article IWA-4000, NSPM will continue to implement ASME XI Code provisions for using the services of an AIA for the R/R related activities.

Implementation of the applicable BWRVIP guidelines for examination of the ASME Section XI Exmination Category B-N-1 and B-N-2 components will ensure that the integrity of the RVI components is maintained with an acceptable level of quality and safety.

E.2 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. Safety Evaluations for many of the BWRVIP guidelines have been issued by the NRC documenting acceptance of the BWRVIP approaches to the examination of RVI components (see References).

Results of examinations and deviations for the BWR fleet are reported under an established protocol between the BWRVIP and the NRC. The BWRVIP Deviation Disposition Process documents deviations by individual licensees from the BWRVIP guidelines and communicates these deviations to the NRC. If the specified implementation schedule is extended to account for unusual circumstances, the deviation disposition process is required to be used and include a technical basis that addresses any increased risk incurred by extending the implementation schedule.

The BWRVIP guidelines have been evaluated for their application to aging management and determined to provide reasonable assurance for identifying aging effects in a timely manner and for continued monitoring of aging degradation in RVI surfaces, attachments, and welded core support structures, provided that the conditions associated with each applicable report are implemented. Safety Evaluations have been issued for many of the BWRVIP guidelines documenting the acceptability of their application to aging management (see References). Therefore, use of these guidelines, as an alternative to the subject ASME Section XI 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 to this enclosure, entitled, "Comparison of ASME Code Section XI Examination Requirements to BWRVIP Examination Requirements," provides examples which compare the inspection requirements of ASME Section XI Code Table IWB-2500-1, Item Numbers B13.10, B13.20, B13.30, and B13.40 to the inspection requirements in the BWRVIP guideline documents. Specific BWRVIP guidelines are provided as examples. This comparison also includes a discussion of the inspection methods. These comparisons demonstrate

that use of the BWRVIP guidelines, as an alternative to the subject ASME Section XI Code requirements, provides an acceptable level of quality and safety and will not adversely impact the health and safety of the public.

The BWRVIP periodically provides the BWR Vessel and Internals Inspection Summaries to the NRC for the entire BWR fleet. 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 outage reports for the individual utilities. Corrective actions and inspections performed prior to the BWRVIP were implemented to the requirements of ASME Section XI, as applicable. The last BWR Vessel and Internals Inspection Summary provided to the NRC which included results for the MNGP was that transmitted to the NRC by the BWRVIP on April 11, 2014 (Reference 18). MNGP has since completed the spring 2015 Refueling Outage and the results will be compiled by the BWRVIP and provided to the NRC in the next periodic update.

F. DURATION OF THE PROPOSED ALTERNATIVE

This proposed 10 CFR 50.55a alternative is requested for the remaining term of the current MNGP Fifth 10-Year Interval.

G. PRECEDENTS

Similar relief requests have been approved by the NRC for the following licensees:

- Grand Gulf Nuclear Station (Reference 19) – June 30, 2014
- River Bend Station (Reference 20) – May 30, 2014
- Oyster Creek Nuclear Generating Station (Reference 21) – August 5, 2013
- Fermi 2 Nuclear Power Station (Reference 22) – February 17, 2012
- Exelon/AmerGen multiple plant submittal for the following units (Reference 23) – April 30, 2008
  - 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
  - Quad Cities Nuclear Power Station, Units 1 and 2
- Vermont Yankee Nuclear Power Station (Reference 24) – September 19, 2005

H. REFERENCES

1. Letter from NRC to NSPM, "Monticello Nuclear Generating Plant – Alternative to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Examination Requirements for the Reactor Pressure Shroud Support Plate Welds H8 and H9 for the Fifth 10-Year Inservice Inspection Program Interval (TAC No. MF3551)," dated January 23, 2015

2. NUREG-1865, "Safety Evaluation Report Related to the License Renewal of the Monticello Nuclear Generating Plant," dated October 2006

3. BWRVIP-139-A: "BWR Vessel and Internals Project, Steam Dryer Inspection and Flaw Evaluation Guidelines," dated July 2009

4. BWRVIP-03, Revision 17: "BWR Vessel and Internals Project, Reactor Pressure Vessel and Internals Examination Guidelines," December 2014 (Electric Power Research Institute (EPRI) [Technical Report] TR-105696-R17)

5. BWRVIP-18, Revision 1-A: "BWR Vessel and Internals Project, BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines," dated April 2012

6. BWRVIP-25: "BWR Vessel and Internals Project, BWR Core Plate Inspection and Flaw Evaluation Guidelines," dated December 1996

7. BWRVIP-26-A: "BWR Vessel and Internals Project, BWR Top Guide Inspection and Flaw Evaluation Guidelines," dated November 2004

8. BWRVIP-27-A: "BWR Vessel and Internals Project, BWR Standby Liquid Control System/Core Plate ΔP Inspection and Flaw Evaluation Guidelines," dated August 2003

9. BWRVIP-38: "BWR Vessel and Internals Project, BWR Shroud Support Inspection and Flaw Evaluation Guidelines," dated September 1997

10. BWRVIP-41, Revision 3: "BWR Vessel and Internals Project, BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines," dated September 2010

11. BWRVIP-47-A: "BWR Vessel and Internals Project, BWR Lower Plenum Inspection and Flaw Evaluation Guidelines," dated June 2004

12. BWRVIP-48-A: "BWR Vessel and Internals Project, Vessel ID Attachment Weld Inspection and Flaw Evaluation Guidelines," dated June 2004

13. BWRVIP-76, Revision 1-A: "BWR Vessel and Internals Project, BWR Core Shroud Inspection and Flaw Evaluation Guidelines," dated April 2015

14. BWRVIP-138, Revision 1-A: "BWR Vessel and Internals Project, Updated Jet Pump Beam Inspection and Flaw Evaluation Guidelines," dated October 2012

15. BWRVIP-180: "BWR Vessel and Internals Project, Access Hole Cover Inspection and Flaw Evaluation Guidelines," dated November 2007

16. BWRVIP-183: "BWR Vessel and Internals Project, Top Guide Grid Beam Inspection and Flaw Evaluation Guidelines," dated December 2007

17. BWRVIP-94NP, Revision 2: "BWR Vessel and Internals Project, Program Implementation Guide," dated September 2011

18. Letter from the Electric Power Research Institute (EPRI) to the NRC, "Project No. 704 – BWR Vessel and Internals Inspection Summaries for the Spring 2013 Outages," dated April 11, 2014 (2014-053)

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 (ADAMS Accession No. ML14148A262)

20. 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 (ADAMS Accession No. ML14127A327)

21. Letter from NRC to Exelon Nuclear, "Oyster Creek Nuclear Generating Station – Relief From the Requirements of the ASME Code, Relief Request No. 15R-01 No. ME9490)," dated August 5, 2013 (ADAMS Accession No. ML13169A062)

22. Letter from NRC to Detroit Edison Company, "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 No. ML120370286)

23. 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 (ADAMS Accession Nos. ML080980311)

24. 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 (ADAMS Accession No. ML052370244)

TABLE 1: MNGP Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements (Notes 1, 5)

Component	ASME Examination Requirements				BWRVIP Examination Requirements			
	ASME Item No. (Table IWB 2500-1)	**ASME Exam Scope**	**ASME Exam Type**	**ASME Frequency**	**Applicable BWRVIP Document**	**BWRVIP Exam Scope**	**BWRVIP Exam**	**BWRVIP Frequency**
Reactor Vessel Interior	B13.10	All accessible areas	VT-3	Each Period in a 10-Year Interval	BWRVIP-18-R1-A, 26-A, 27-A, 38, 41-R3, 47-A, 76-R1-A, 180	Overview examination of components during BWRVIP examinations meets the intent of the Code VT-3 inspection requirements.		
Interior Attachments Within the Beltline – Jet Pump Riser Braces (Primary)	B13.20	All accessible welds	VT-1	Each 10-Year Interval	BWRVIP-48-A, Table 3-2	Jet Pump Riser Brace Brackets (Primary)	EVT-1	25% every 6 years
Interior Attachments Within the Beltline – Jet Pump Riser Braces (Secondary)		All accessible welds	VT-1		BWRVIP-48-A, Table 3-2	Jet Pump Riser Brace Brackets (Secondary)	VT-1	Each 10-Year Interval
Interior Attachments Within the Beltline - Lower Surveillance Sample Holder Brackets		All Accessible Welds	VT-1		BWRVIP-48-A, Table 3-2	Lower Surveillance Sample Holder Bracket		
Interior Attachments Beyond the Beltline – Steam Dryer Holddown Brackets	B13.30	All Accessible Welds	VT-3	Each 10-Year Interval	BWRVIP-48-A, Table 3-2	Steam Dryer Holddown Brackets	VT-3	Each 10-Year Interval
Interior Attachments Beyond the Beltline – Steam Dryer Support Brackets					BWRVIP-48-A, Table 3-2	Steam Dryer Support Brackets		

TABLE 1: MNGP Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements (Notes 1, 5)

Component	ASME Examination Requirements				BWRVIP Examination Requirements			
	ASME Item No. (Table IWB 2500-1)	**ASME Exam Scope**	**ASME Exam Type**	**ASME Frequency**	**Applicable BWRVIP Document**	**BWRVIP Exam Scope**	**BWRVIP Exam**	**BWRVIP Frequency**
Interior Attachments Beyond the Beltline – Guide Rod Brackets	B13.30	All Accessible Welds	VT-3	Each 10-Year Interval	BWRVIP-48-A, Table 3-2	Guide Rod Brackets	VT-3 (continued)	Each 10-Year Interval (continued)
Interior Attachments Beyond the Beltline – Feedwater Sparger Brackets					BWRVIP-48-A, Table 3-2	Feedwater Sparger Brackets		
Interior Attachments Beyond the Beltline – Upper Surveillance Sample Holder Brackets					BWRVIP-48-A, Table 3-2	Upper Surveillance Sample Holder Brackets		
Interior Attachments Beyond the Beltline – Core Spray Piping Brackets					BWRVIP-48-A, Table 3-2	Core Spray Piping Brackets	EVT-1	100% Every 4 refueling outages
Interior Attachments Beyond the Beltline – Shroud Support Welds (H9) (Note 2)					BWRVIP-38, 3.1.3.2 and Figure 3-5	H9 Shroud Support Weld	EVT-1 or UT	10% of the circumference every 10 years (UT) or every 6 years (EVT-1)
Interior Attachments Beyond the Beltline – Shroud Support Leg Welds (H12)					BWRVIP-38, 3.2.3, 3.3.3	Shroud Support Leg Welds (H12)	VT-3 or better (Note 3)	Only if H8 and H9 welds are determined to be structurally inadequate

TABLE 1: MNGP Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements (Notes 1, 5)

Component	ASME Examination Requirements				BWRVIP Examination Requirements			
	ASME Item No. (Table IWB 2500-1)	**ASME Exam Scope**	**ASME Exam Type**	**ASME Frequency**	**Applicable BWRVIP Document**	**BWRVIP Exam Scope**	**BWRVIP Exam**	**BWRVIP Frequency**
Welded Core Support Structure – Shroud Support (H8 and H9 Welds) (Note 2)	B13.40	All accessible surfaces	VT-3	Each 10-Year Interval	BWRVIP-38, 3.1.3.2 and Figures 3-4 and 3-5	H8 and H9 welds	EVT-1 or UT	10% of circumference every 10 years (UT) or 6 years (EVT-1)
Welded Core Support Structure – Shroud Support Legs (H10, H11, and H12) (Note 4)					BWRVIP-38, 3.2.3 and 3.3.3	H10, H11, and H12 welds	VT-3 or better (Note 3)	Only if H8 and H9 welds are determined to be structurally inadequate
Welded Core Support Structure – Shroud / Horizontal Welds					BWRVIP-76-R1-A, Section 2.2, Figure 2-3	H1-H7 welds	EVT-1 or UT	Based on as-found condition of welds, maximum of 6 years (One-sided EVT-1) or 10 years (UT/Two-sided EVT-1)
Welded Core Support Structure – Shroud / Vertical Welds	B13.40	All accessible surfaces	VT-3	Each 10-Year Interval	BWRVIP-76-R1-A, Section 2.3, Figure 2-3, 2-4, 2-5	Vertical Welds (Selection based on condition, fluence and	EVT-1 or UT	Based on as-found condition of welds, maximum of 6 years (One-sided EVT-1) or

TABLE 1: MNGP Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements (Notes 1, 5)

Component	ASME Examination Requirements				BWRVIP Examination Requirements			
	ASME Item No. (Table IWB 2500-1)	**ASME Exam Scope**	**ASME Exam Type**	**ASME Frequency**	**Applicable BWRVIP Document**	**BWRVIP Exam Scope**	**BWRVIP Exam**	**BWRVIP Frequency**
Welded Core Support Structure – Shroud / Vertical Welds (continued)						coverage of associated H1-H7 welds. (continued)		10 years (UT/Two-sided EVT-1) (continued)

NOTES

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 addition, to the inspection requirements outlined in BWRVIP-38, NSPM will continue to implement the inspection requirements for both the MNGP H8 and H9 welds as described in Relief Request RR-008 approved in NRC SER dated January 23, 2015. (Reference 1 in Enclosure 1), or as specified in any future NRC approved revision to RR-008.

3. The shroud support leg welds (H10, H11, and H12) are located in the lower plenum of the reactor vessel under core plate. The limited accessibility makes inspections in the area difficult. When these inspections are performed, the exam type is a "best effort" examination in which the NDE personnel obtain the best quality and coverage that the access limitation will allow.

TABLE 1: MNGP Comparison of ASME Examination Category B-N-1 and B-N-2 Requirements With BWRVIP Guidance Requirements (Notes 1, 5)

4. NSPM has identified flaws on all of the MNGP H10 leg welds of the shroud support legs and flaws on multiple areas of the H8 and H9 welds. As a result, NSPM is inspecting H10 welds each period until it can be demonstrated that the flaws on the H10 welds have stabilized. Flaws are considered stabilized after 3 consecutive inspections periods with no flaws changes in accordance with ASME Section XI. After the flaws are determined to be stabilized, NSPM will revert back to the original inspection schedule for the MNGP.

5. The MNGP has no installed core shroud repairs. In the event core shroud repairs become necessary, inspections of the repair will be performed in accordance with the guidance established in BWRVIP-76.

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. ASME Section XI 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, or 3 times during the 10-year 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 the Core Spray Piping and Spargers (BWRVIP-18-R1-A), Top Guide (BWRVIP-26-A), Jet Pump Welds and Components (BWRVIP-41-R3), Interior Attachments (BWRVIP-48-A), Core Shroud Welds (BWRVIP-76-R1-A), Shroud Support (BWRVIP-38), and Lower Plenum Components (BWRVIP-47-A), for example, 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 at a similar or more frequent basis as that required by the ASME Section XI Code. For example, evidence of wear, structural degradation, loose, missing, or displaced parts, foreign materials, and corrosion product buildup can be, and has been observed across the industry 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. ASME Section XI Code Requirement B13.20 – Interior Attachments within Beltline Region (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-reactor vessel wall and the lower surveillance specimen support bracket welds-to-reactor 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 requirements. 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. ASME Section XI Code Requirement B13.30 – Interior Attachments Beyond 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-reactor vessel wall, the upper surveillance specimen support bracket welds-to-reactor 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-reactor vessel welds. 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-reactor 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-reactor 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. ASME Section XI Code Requirement B13.40 – Welded Core Support Structure (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. Historically, this requirement has been interpreted and satisfied differently across the industry. The proposed alternate examination replaces this ASME Code 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 ASME Code requires a VT-3 examination 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 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 provides for a volumetric examination of the susceptible welds at a frequency identical to the Code requirement. EVT-1 is also a recommended method of examination; however the exam is required at a higher frequency, with a maximum inspection interval of six years.

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 (Support (BWRVIP-76, Revision 1)

- The ASME Code requires a VT-3 examination of accessible surfaces each 10-year interval.
- The BWRVIP requires an EVT-1 examination from the inside and outside surface of each applicable weld or ultrasonic examination (UT) 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.