

4300 Winfield Road Warrenville, IL 60555 630 657 2000 Office

June 29, 2017

10 CFR 50.55a

RS-17-083

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

> Byron Station, Units 1 and 2 Renewed Facility Operating License Nos. NPF-37 and NPF-66 NRC Docket Nos. STN-50-454 and STN 50-455

Subject: Inservice Inspection Program Third Interval Relief Requests I3R-12 and I3R-15

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (g)(5)(iii), Exelon Generation Company, LLC (EGC), is submitting two requests for relief due to impracticality of satisfying the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." As noted in 10 CFR 50.55a(g)(5)(iii), "Requests for relief made in accordance with this section must be submitted to the NRC no later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought." The subject relief requests are associated with the third interval for Units 1 and 2, which ended July 15, 2016. Note that Relief Request I3R-12 is applicable to Units 1 and 2 whereas Relief Request I3R-15 is applicable to Unit 2 only.

The relief requests are based on limitations that precluded full code examination requirements of ASME Class 1 and 2 welds during the third interval. Code examination of the welds is limited due to materials of construction and design configurations.

There are no regulatory commitments contained within this letter. Should you have any questions concerning this submittal, please contact Joseph A. Bauer at 630 657-2804.

Respectfully,

David M. Gullott Manager – Licensing Exelon Generation Company, LLC

Attachments: 1. 10 CFR 50.55a Relief Request I3R-12 2. 10 CFR 50.55a Relief Request I3R-15 June 29, 2017 U. S. Nuclear Regulatory Commission Page 2

cc: NRC Regional Administrator – Region III NRC Senior Resident Inspector – Byron Station NRC Project Manager, NRR – Byron Station Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1

10 CFR 50.55a RELIEF REQUEST I3R-12 Revision 0

Request for Relief Regarding Inservice Inspection Impracticality Due to Limited Examinations on Pressurizer Surge, Spray, Safety, and Relief Nozzle-to-Vessel Welds In Accordance with 10 CFR 50.55a(g)(5)(iii)

10 CFR 50.55a RELIEF REQUEST I3R-12 Revision 0 (Page 1 of 6)

Request for Relief Regarding Inservice Inspection Impracticality Due to Limited Examinations on Pressurizer Surge, Spray, Safety, and Relief Nozzle-to-Vessel Welds In Accordance with 10 CFR 50.55a(g)(5)(iii)

1.0 ASME CODE COMPONENTS AFFECTED

Code Class:	1
Reference:	IWB-2500, Table IWB-2500-1
Examination Category:	B-D
Item Number:	B3.110
Description:	Limited Examinations on Pressurizer Surge, Spray, Safety, and
	Relief Nozzle-to-Vessel Welds
Component Number:	Unit 1
	1RY-01-S/PN-01, 1RY-01-S/PN-02, 1RY-01-S/PN-03,
	1RY-01-S/PN-04, 1RY-01-S/PN-05, and 1RY-01-S/PN-06
	Unit 2
	2RY-01-S/PN-01, 2RY-01-S/PN-02, 2RY-01-S/PN-03,
	2RY-01-S/PN-04, 2RY-01-S/PN-05, and 2RY-01-S/PN-06
Drawing Number:	1PZR-1-ISI (Unit 1)
	2PZR-1-ISI (Unit 2)

2.0 APPLICABLE CODE EDITION AND ADDENDA

The Third Interval Inservice Inspection Program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2001 Edition through the 2003 Addenda. The 2001 Edition through 2003 Addenda requires essentially 100% examination coverage of required surfaces and volumes of Class 1 components.

3.0 APPLICABLE CODE REQUIREMENT

ASME Code Section XI, 2001 Edition through the 2003 Addenda requires a volumetric and/or surface examination, which includes essentially 100% of the weld and the applicable base metal, for the affected examination categories.

Table IWB-2500-1, Examination Category B-D, Item B3.110 requires volumetric examination of the Pressurizer Nozzle-to-Vessel welds as detailed in Figure IWB-2500-7(b).

10 CFR 50.55a RELIEF REQUEST I3R-12 Revision 0 (Page 2 of 6)

ASME Code Section XI Mandatory Appendix I requires ultrasonic examination of vessel welds greater than 2 inches thick to be conducted in accordance with ASME Section V, Article 4, as supplemented by Table I-2000-1.

ASME Section V, Article 4 requires:

T-472.1.1 Beam Angle: The search unit and beam angle selected shall be appropriate for the configuration being examined and shall be capable of detecting the calibration reflectors, over the required angle beam path.

T-472.1.2 Reflectors Parallel to the Weld Seam: The angle beam shall be directed at approximate right angles to the weld axis from both sides of the weld (i.e., from two directions) on the same surface when possible. The search unit shall be manipulated so that the ultrasonic energy passes through the required volume of weld and adjacent base metal material.

T-472.1.3 Reflectors Transverse to the Weld Seam: The angle beam shall be directed essentially parallel to the weld axis. The search unit shall be manipulated so that the ultrasonic energy passes through the required volume of weld and adjacent base material. The search unit shall be rotated 180 degrees and the examination repeated.

Byron Station has invoked ASME Section XI Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 welds, Section XI Division 1." Code Case N-460 states in part, "...when the entire examination volume or area cannot be examined...a reduction in examination coverage...may be accepted provided the reduction in coverage for that weld is less than 10%."

4.0 IMPRACTICALITY OF COMPLIANCE

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with these Code requirements is impractical, as conformance would require extensive structural modifications to the pressurizer vessel without providing a corresponding increase in the level of quality and safety.

10 CFR 50.55a(g)(4) states; "Throughout the service life of a boiling or pressurized watercooled nuclear power facility, components (including supports) which are classified as ASME Code Class 1, Class 2 and Class 3 must meet the requirements ... set forth in Section XI of editions of the ASME Boiler and Pressure Vessel Code and Addenda ... to the extent practical within the limitations of design, geometry and materials of construction of the components." The geometry and materials of construction of the subject pressurizer nozzles results in limited access to the entire examination volume. The pressurizer nozzle surge, spray, safety, and relief nozzle-to-vessel welds are clad with stainless steel on the inside diameter surface and are approximately 3.0 inches thick. Figures 1, 2, and 3 detail the weld and pressurizer nozzle configurations, diameters, and limitations for examination coverage encountered for the subject pressurizer welds at Byron Station during the Third Inservice Inspection (ISI) Interval. In addition, Attachment A, "Relief Request I3R-12, Supporting Documentation," shows examination coverages attained for each of the subject nozzle welds.

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During previous outages, the nozzles were examined by the ultrasonic method. The three limiting factors in the scanning of these nozzles are as follows:

- a) the minimum scanning surface available on the nozzle side of the weld (component geometry);
- b) the minimum scanning surface available on the vessel side of the weld (obstruction from pressurizer penetrations on lower head); and
- c) the inability of the ultrasonic beam to reach beyond a ½Vee sound path (due to the materials of construction).

Furthermore, based on review of the coverage plots, differences in the total coverage achieved can be attributed to geometric variations between the two units such as the weld crown width used in determining the total volume to be examined, the weld toe locations in relation to the curvature of the nozzle (i.e., the location of the examination volume prior to experiencing the limitation caused by the curvature of the nozzle) and the scans performed.

In Byron Station, Unit 1, Refueling Outage 14 (i.e.,B1R14), B2R13, and B2R15, scanning for the pressurizer surge, spray, safety, and relief nozzles was performed with 0 degree longitudinal scans and with 45 degree and 60 degree scans in the shear mode from the outside surface of the vessel. During B1R20 and B2R18, the pressurizer relief nozzles were scanned with a 45 degree scan (only) in the shear mode from the outside surface of the vessel. Only a 45 degree scan was performed for the B1R20 and B2R18 examinations because, in accordance with ASME Section XI, 2001 Edition, 2003 Addenda, Mandatory Appendix I, vessels greater than 2 inches in thickness are examined in accordance with ASME Section V, Article 4 as supplemented by Table I-2000-1 which did not require the 60 degree scan for outside diameter examinations. In addition, Paragraph T-472.1.1, Beam Angle, states the search unit and beam angle selected shall be appropriate for the configuration being examined and shall be capable of detecting the calibration reflectors, over the required angle beam path. Note that Supplement 9 of Mandatory Appendix I, which requires both a 45 degree and 60 degree scan, is interpreted to be applicable for examinations conducted from the inside diameter clad surface of vessels only.

There were no recordable indications requiring further evaluation noted in any of the volumetric examinations performed. The examinations were conducted and satisfactory results were confirmed, even though essentially 100% coverage was not attained. Figures 1, 2, and 3 represent the aggregate examination coverage that was achieved for each pressurizer surge, spray, safety, and relief nozzle-to-vessel weld.

As previously stated, the propagation for the ultrasonic beam was in the shear mode. Normally this mode would allow the ultrasonic beam to reflect off the inside surface and create two beam axes at right angles to each other. This technique is not possible due to the stainless steel cladding on the inside of the vessel. The ultrasonic beam would not be completely reflected from the shell/clad interface. Most of the sound energy would be refracted through this layer and would be scattered as it reflected from the as-welded clad inside surface. Any sound energy reflected from the shell/clad interface would be of such low amplitude that it would be useless for examination purposes.

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5.0 BURDEN CAUSED BY COMPLIANCE

Compliance with the applicable Code requirements can only be accomplished by redesigning and refabricating the subject vessel nozzles. Based on this fact, the Code requirements are deemed impractical and meet the criteria for relief in accordance with 10 CFR 50.55a(g)(5)(iii).

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

The Code required ultrasonic examinations for the subject pressurizer nozzle-to-vessel welds were performed to the maximum extent possible based on the obstructions and geometric constraints detailed in Section 4.0, "Impracticality of Compliance," of this relief request. There were no additional scanning surfaces, search unit angles, or surface preparation activities that would provide reliable additional examination coverage.

In addition to completing the required volumetric examination to the extent practical, a System Leakage Test and associated VT-2 examination are performed in accordance with Section XI Examination Category B-P. This leak test and VT-2 examination are performed every outage at nominal system operating pressure and temperature to verify leak tight integrity of the system. No evidence of leakage associated with the pressurizer surge, spray, safety, or relief nozzle-to-vessel welds has been noted. The results of the ultrasonic examination and system leakage test provide reasonable assurance that pressure boundary integrity has been, and will remain, maintained for the associated components.

Radiography as an alternative is not feasible because access is not available for film placement. No alternative examinations were planned for the weld during the Third ISI Interval.

7.0 DURATION OF PROPOSED ALTERNATIVE

Relief is requested for the Third Ten-Year Inservice Inspection (ISI) Interval for Byron Station, Units 1 and 2. For the examination categories applicable to this relief, the Third Interval for Byron Station, Units 1 and 2 began on January 16, 2006 and concluded on July 15, 2016.

8.0 PRECEDENTS

Similar relief requests for limitations resulting in examination coverage less than 90% have been previously approved for Byron Station. The Byron Station Second Inservice Inspection Interval Relief Request, I2R-23, was authorized in an NRC Safety Evaluation dated January 15, 2008 (ML073230312). Additionally, the Byron Station Second Inservice Inspection Interval Relief Request, I2R-03, was authorized in an NRC Safety Evaluation dated December 30, 1998.

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Figure 3: Pressurizer 84 Series Model D 6"Ø Safety and Relief Nozzles (Drawing not to scale) Ref: Westinghouse Drawing EDSK379558 B

10 CFR 50.55a RELIEF REQUEST I3R-12 Revision 0

ATTACHMENT A

Relief Request I3R-12 Supporting Documentation



PAGE 4 or 6



1 RY-01-5 PN-01 BIR14-UT-035

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Coverage O = 100% 4500 = 100% 4500 = 100% 4500 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20 = 100% 60° 20% 60



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Supplemental Report

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							Page:	2	of	3
Su	immary No.:	1-B3.110.0004								
	Examiner:	Tauchen, Ryan J. 🔀	C^2 ,	Level: II-PDI	Reviewer:	Richard Fuller, Level III	Mall	Date:	9/20	115
	Examiner:	Jackson, Tommy	ny E. peham	Level: II-PDI	Site Review:	Chris H. McKenni L	VIII ch. Hauch	Date:	9/21	115
	Other:	N/A		Level: N/A	ANII Review:	TAMES WNIEMERC	Janes u Nameny	Date:	22.50	P15
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Comments: Coverage Calculations

Sketch or Photo: O:\Outage Data\Byron\B1R20\/SI\Pics - Drawings\1RY-01-S PN-04.jpg

Examination limited due to Nozzie to Vessel configuration. Due to inconnel cladding, examination is limited to 1/2 V-Path technique.

A.S.M.E. exam figure: IWB-2500-7 (b)

Weld Crown Width: 2.5"

Weld T: 2.8" (Nominal)

Required exam coverage area: 811.2 sq. in.

45° Circumferential exam coverage achieved: 184.6 eq In. (81.2%) CW 45° Circumferential exam coverage achieved: 184.6 eq In. (81.2%) CCW

45" Axial (upstream) exam coverage achieved: 202.5 ag In. (97.35%)

45° Axial (downstream) exam coverage achieved: 0 Coverage

81.2 + 81.2 + 97.35 + 0 = 259.75 / 4 = 64.93%

Total exam coverage achieved = 64.83%

Galaulations performed by: Tommy Jackson, Level II-PDI





Fxelon.

Supplemental Report

Exelo				Report No.:	B1R2	0-UT-029
				Page:	2	of <u>3</u>
Summary No.:	1-B3.110.0005					
Examiner:	Tauchen, Ryan J. TEC	Level: II-PDI	Reviewer: Richard Fuller, L	ever III Apullo	Date:	9/21/5
Examiner:	Jackson, Tommy Jommy E. Jechson	Level: II-PDI	Site Review: Chais H. Mila	1400 Lotte chittach	-Date:	9/21/15
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Comments:	Coverage Calculations					

Sketch or Photo: O:\Outage Data\Byron\B1R20\ISI\Pics - Drawings\1RY-01-S PN-05.jpg

Examination limited due to Nozzle to Vessel configuration. Due to inconnet cledding, examination is limited to 1/2 V-Path technique.

A.S.M.E. exam figure: IW9-2500-7 (b)

Weld Crown Width: 2.5"

Weld T: 2.8" (Nominal)

Required axam coverage area: 811.2 sq. in.

45° Circumferential exem coverage achieved: 184.6 eq in. (81.2%) CW

45* Circumferential axam coverage achieved: 164.6 sq in, (81.2%) CCW 45° Axial (upstream) axam coverage achieved: 202.5 sq in. (97.35%)

45° Axial (downstream) exem coverage achieved: 0 Coverage

81.2 + 81.2 + 97.35 + 0 = 258.75 / 4 = 64.93%

Total exam coverage achieved = 64.83%

Calculations performed by: Tommy Jackson, Level H-PDF









10 CFR 50.55a Relief Request I3R-12 Attachment A

	WESTINGHOUSE NUCLEAR SERVICES Data Sheet No: 2004-004-027 Page 5 of 6						
	LIMITATION TO EXAMINATION						
(Section)	PLANT BYRON UNIT 2 SKETCH 2PZR-1-ISI						
	SYST./COMP. PZR/2RY-01-S PROCEDURE EXE-ISI-210 Rev. 0						
	EXAMINER DATE 3/27/04						
	RELATED TO: UT X PT MT VT IDENT NO. PN-02 PROVIDE GENERAL INFORMATION TO DESCRIBE APPROXIMATE SIZE, LOCATION AND TYPE OF LIMITATION.						
	N O A B C O A						
	Examination limited due to Nozzle-to-Vessel configuration. Due to inconnel cladding, Examination is limited to 1/2 V-path technique.						
	Weld crown width: 1.5" Weld 'T': 2.8" (NOMINAL)						
	Required exam coverage area: 12.65 sq. in. 0° Exam coverage achieved: 8.12 sq. in. (64.2%) 45° Circumferential exam coverage achieved: 8.12 sq.in. (64.2%) 60° Circumferential exam coverage achieved: 8.12 sq.in. (64.2%) 45° Axial (upstream) exam coverage achieved: 3.78 sq.in. (29.8%) 60° Axial (upstream) exam coverage achieved: 3.36 sq.in. (26.5%) 45° Axial (downstream) exam coverage achieved: 11.74 sq.in. (92%) 60° Axial (downstream) exam coverage achieved: 12.02 sq.in. (95%)						
0	Total exam coverage achieved: 62.3% $T_{a} = \frac{115}{3/28/64}$						
	Exelon Level III Review / Date ANII Review / Date						



	()		
0°	629	864	72.8%
45° H	721	864	83.5%
45° N	291	864	33.7%
60° H	832	864	96.3%
60° N	164	864	19.0%
45° CW	629	864	72.8%
45° CCW	629	864	72.8%
60° CW	629	864	72.8%
60° CCW	629	864	72.8%

H = Head Side

N = Nozzle Side

Total = 597% / 9 = 66.3%

Examination Volume = 864 cubic inches Weld Width = 2.5" Thickness = 3.1" Exam Width = 5.5" (2.5" + 1.5" each side) Weld Length = 50.7"

Exelon

Supplemental Report

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				Page:	2	of	3
Summary No.:	2-B3.110.0004		PhilipShamblin				
Examiner:	Serth, Joseph P.	Level: II-PDI	Reviewer: Chiles Change A	v.TT	Date:	10-	6-14
Examiner:	NA	Level: N/A	Site Review Tay Miller 1 - NO C. T		Date:	10 9	-14
Other:	N/A	Level: N/A	ANII Review: Jamesur Niemer Jameter (4	were	Date: _	ØDET	14
			- L-	5			

Comments: Coverage calculations taken from previous report (2004-087).

Sketch or Photo: O:\Outage Data\Byron\B2R18\ISI Photos\2RY-01-S PN-04.jpg

Examination limited due to Nozzie to Vessel configuration. Due to inconnel cledding, examination is limited to ½ V-path technique.

A.S.M.E. exam figure: IW/B-2500-7 (b)

Weld Crown Width: 1.5* Weld 'T': 2.8" (Nominal)

Required exam coverage area: 12.65 sq in.

45° Groumferential exam coverage achieved: 8.12 sq in. (64.2%) CW 45° Circumferential exam coverage achieved: 8.12 sq in. (64.2%) CCW 45° Axial (upstreem) exam coverage achieved: 3.78 sq in. (29.8%) 45° Axial (downstream) exam coverage achieved: 11.74 sq in. (92%) 64.2 + 64.2 + 93.8 + 92.0 = 250.2 / 4 = 62.55 Total exam coverage achieved = 82.55%

Calculations performed by: Joseph Serth





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Exelon	Supplemental Report
Summary No.: 2-B3.110.0005	
Examiner: Serth, Joseph P.	Level: II-PDI Reviewer:

Reviewer: Mil Manblin Phil. A. Anomeric ho. III	Date:	10-6-14
Site Review: Jag Mille 1 - NOLTE	Date:	10-10-14
ANII Review: James W Niemen Oanes le Mumery	Date:	1000514

Report No.: B2R18-UT-019

2 of 3

Page:

Comments: Coverage calculations taken from previous report (2004-087).

Sketch or Photo: O:\Outage Data\Byron\B2R18\ISI Photos\2RY-01-S PN-05.jpg

Examination limited due to Nozzle to Vessel configuration. Due to inconnel cledding, examination is limited to X V-path technique.

A.S.M.E. exam figure: IWB-2500-7 (b)

Level: N/A

Level: N/A

Weld Crown Width: 1.5" Weld 'T': 2.8" [Nominal]

Required exem coverage area: 12.65 sq in.

45* Circumferential exam coverage achieved: 8.12 sq in. (64.2%) CW 45° Circumferential exam coverage achieved: 8.12 sq in. (64.2%) CCW 45° Axial (upstream) exam coverage achieved: 3.78 sq In. (29.8%) 45" Axiel (downstream) exam coverage achieved: 11.74 sr in. (92%) 64.2 + 64.2 + 29.8 + 92.0 = 250.2 / 4 = 62.55 Total exam coverage achieved = 62.55%

Calculations performed by: Joseph Serbi





Examiner: N/A

Other: N/A







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Total = 597% / 9 = 66.3%

ATTACHMENT 2

10 CFR 50.55a RELIEF REQUEST I3R-15 Revision 0

Request for Relief Regarding Inservice Inspection Impracticality Due to Limited Volumetric Examination of Reactor Vessel Circumferential Shell Welds In Accordance with 10 CFR 50.55a(g)(5)(iii)

10 CFR 50.55a RELIEF REQUEST I3R-15 Revision 0 (Page 1 of 4)

Request for Relief Regarding Inservice Inspection Impracticality Due to Limited Volumetric Examination of Reactor Vessel Circumferential Shell Welds In Accordance with 10 CFR 50.55a(g)(5)(iii)

1.0 ASME CODE COMPONENTS AFFECTED

Code Class:	1
Reference:	IWB-2500, Table IWB-2500-1
Examination Category:	B-A
Item Number:	B1.11
Description:	Limited Volumetric Examination of Reactor Vessel
	Circumferential Shell Welds
Component Number:	2RC-01-R/WR-29 (Unit 2)
Drawing Number:	2RPV-1-ISI (Unit 2)

2.0 APPLICABLE CODE EDITION AND ADDENDA

The Third Interval Inservice Inspection Program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2001 Edition through the 2003 Addenda. The 2001 Edition through 2003 Addenda requires essentially 100% examination coverage of required surfaces and volumes of Class 1 components.

3.0 APPLICABLE CODE REQUIREMENT

ASME Code Section XI, 2001 Edition through the 2003 Addenda requires a volumetric and/or surface examination, which includes essentially 100% of the weld and the applicable base metal, for the affected examination categories.

Table IWB-2500-1, Examination Category B-A, Item B1.11 requires volumetric examination of the Reactor Vessel Circumferential Shell welds as detailed in Figure IWB-2500-1.

Byron Station has invoked ASME Section XI Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 welds, Section XI Division 1." Code Case N-460 states in part, "...when the entire examination volume or area cannot be examined...a reduction in examination coverage...may be accepted provided the reduction in coverage for that weld is less than 10%."

As required by 10 CFR 50.55a, the 2001 Edition through 2003 Addenda of the ASME Code, Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," was used for examination procedures, equipment, and personnel.

10 CFR 50.55a RELIEF REQUEST I3R-15 Revision 0 (Page 2 of 4)

4.0 IMPRACTICALITY OF COMPLIANCE

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the specified Code requirement has been determined to be impractical. Due to the original design and geometry associated with the reactor vessel weld, it is not feasible to effectively perform examinations of 100% of the volume of the weld. Therefore, relief is requested on the basis that the Code requirements to examine essentially 100% of the weld volume is impractical due to physical obstructions and geometry of the reactor vessel and concrete support structure. Attaining the necessary geometry to achieve the Code required examination coverage would involve major modifications to the existing component and support structure without providing a corresponding increase in the level of quality and safety.

The reactor vessel lower head circumferential weld is clad with stainless steel on the inside diameter (I.D.) surface and is restricted by six core barrel lugs welded to the inner surface of the vessel approximately four inches above the weld. These lugs obstruct the automated ultrasonic inspection tool from completely examining the code required volume of the weld. Where access is available, the weld metal can be examined from below and between the core barrel lugs on the I.D. of the vessel. Access to allow examination from the outside diameter (O.D.) (shell side) of the weld is restricted due to the structural concrete surrounding the vessel.

The examination scan plan consisted of using a 45 degree nominal angle with a single longitudinal beam, a dual longitudinal beam, and a shear beam. The aggregate examination coverage achieved for the circumferential weld was 79.25% and the examination identified zero recordable indications during the Byron Station Unit 2 Refueling Outage 13 (i.e., B2R13). This documented coverage is more than what was achieved during the previous Inservice Inspection (ISI) Interval when using a different contractor, ultrasonic testing (UT) system tooling, and scan plan (i.e., 57% coverage was attained during B2R07).

Figure 1 details the weld and vessel configuration, thickness, diameter, and limitations for examination coverage encountered for the reactor vessel lower head circumferential weld at Byron Station during the Third ISI Interval. In addition, Attachment A, "Relief Request I3R-15, Supporting Documentation," shows the examination coverage attained for the subject weld.

5.0 BURDEN CAUSED BY COMPLIANCE

Compliance with the applicable Code requirements can only be accomplished by redesigning and refabricating the reactor vessel and/or the structure surrounding the vessel. Based on this fact, the Code requirements are deemed impractical and meet the criteria for relief in accordance with 10 CFR 50.55a(g)(5)(iii).

10 CFR 50.55a RELIEF REQUEST I3R-15 Revision 0 (Page 3 of 4)

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

The Code required volumetric examination for the subject reactor vessel lower head circumferential weld has been performed to the maximum extent possible based on the obstructions and geometric constraints detailed in Section 4.0, "Impracticality of Compliance," of this relief request.

In addition to completing the required volumetric examination to the extent practical, a System Leakage Test and associated VT-2 examination are performed in accordance with Section XI Examination Category B-P. This leak test and VT-2 examination are performed every outage at nominal system operating pressure and temperature to verify leak tight integrity of the system. No evidence of leakage associated with the reactor vessel lower head circumferential weld has been noted. The results of the ultrasonic examination and system leakage test provide reasonable assurance that pressure boundary integrity has been, and will remain, maintained for this component.

Radiography as an alternative is not feasible because access is not available for film placement. No alternative examinations were planned for the weld during the Third ISI Interval.

7.0 DURATION OF PROPOSED ALTERNATIVE

Relief is requested for the Third Ten-Year Inservice Inspection (ISI) Interval for Byron Station, Units 1 and 2. For the examination categories applicable to this relief, the Third Interval for Byron Station Units 1 and 2 began on January 16, 2006 and concluded on July 15, 2016.

8.0 PRECEDENTS

Similar relief requests for limitations resulting in examination coverage less than 90% have been previously approved for Byron Station. The Byron Station Second Inservice Inspection Interval Relief Request, I2R-01, was conditionally granted in an NRC Safety Evaluation dated December 30, 1998.

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Figure 1

10 CFR 50.55a RELIEF REQUEST I3R-15 Revision 0

ATTACHMENT A

Relief Request I3R-15 Supporting Documentation

10 CFR 50.55a Relief Request I3R-15 Attachment A

2BVSR 4.F-2.2 Attachment 4.3 B2R				
С	OMPONENT II	NFORMATION	n dan kanalari kanala	
Line/Vessel # Weld/Area Numl	ber	2RC-01-R WR-29		
B2R13 Observation I	Number	13-110		
Description	Lower Shel	I to Bottom Head Torus		
ASME Code Cate ASME Code Item N	gory umber	B-A B1.11		
WesDyne Report # /	Data #	W4		
EXAM	INATION RES	ULTS/COMMENTS		
No Recordable Indications	5.			
Scan obstructed by core s	upport lugs.			
% of Code Requ	ired Volume A	chieved: 79.25%		
Applicable Relief Request: I3R-15				
Number of Pages	Recordable Ex	Cover Page Indication Report camination Report TOTAL	1 - 40 41	

Volumetric Examination Cover Sheet

WesDyne International Reactor Vessel Weld Results Summary

BYRON UNIT 2







RPV COVERAGE ESTIMATE BREAKDOWNS

DIRECTION / ORIENTATION

PARALLEL SCANS	CCW/CW
PERP. SCANS	UP/DN

WELD	LOWER SHELL TO BOTTOM HEAD	1
DESCRIPTION	TORUS	

WELD NO.	RPVC-WR29

BEAM ANGLES

BEAM DIRECTION	45° L Dual	45° L Single	45° Shear		
CCW	81.18	81.18	81 . 18		
CW	81.18	81.18	81.18		
UP	64.18	69.80	98.0		
DOWN	64.18	* 69.80	* 98.0		
TOTAL					
Combined Average = 79.25%	* Combination of Single & Dual Sided Coverage				

JAS. ANALYST



10 CFR 50.55a Relief Request I3R-15 Attachment A