

October 26, 2006

LTR: BYRON 2006-0119
File: 1.10.0101

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

Byron Station, Unit 1
Facility Operating License No. NPF-37
NRC Docket No. 50-454

Subject: Pressurizer Weld Overlay Examination Results Related to Byron Station Relief Request I3R-08

- References:
- (1) Letter from D. M. Hoots (Exelon Generation Company, LLC) to U. S. NRC, "3rd 10-Year Inservice Inspection Interval, Relief Request I3R-08, Preventive Weld Overlays on Pressurizer Spray, Relief, Safety and Surge Nozzles and Associated Alternative Repair Techniques," dated April 28, 2006
 - (2) Letter from D. M. Hoots (Exelon Generation Company, LLC) to U. S. NRC, "Response to NRC Request for Additional Information to Byron Station Relief Request I3R-08," dated August 18, 2006
 - (3) Letter from K. R. Jury (Exelon Generation Company, LLC) to U. S. NRC, "Commitment Regarding Byron Station Relief Request I3R-08," dated September 14, 2006

The Reference 1 submittal proposed an alternative (i.e., Relief Request I3R-08), in accordance with 10 CFR 50.55a(a)(3)(i), to the repair/replacement requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 2001 Edition, through 2003 Addenda, IWA-4000, for the structural weld overlays on the Byron Station pressurizer spray, relief, safety and surge nozzle safe-ends. The Reference 2 submittal provided additional information in support of the proposed alternative.

In a September 14, 2006, teleconference between representatives of the NRC and Exelon Generation Company, LLC (EGC), the NRC requested that EGC provide a commitment to provide the details of the ultrasonic examination results of the structural weld overlays on the Byron Station Unit 1 pressurizer spray, relief, safety and surge nozzle safe-ends to the NRC within 14 days of the completion of the final ultrasonic examination.

This commitment was provided in the Reference 3 submittal. After receipt of the Reference 3 submittal, the NRC granted verbal approval of Relief Request I3R-08 for Byron Station Unit 1.

In accordance with the Reference 3 commitment, EGC is providing the details of the ultrasonic examination (UT) results of the structural weld overlays on the Byron Station Unit 1 pressurizer spray, relief, safety and surge nozzles. The final weld overlay UT conducted during the B1R14 outage was completed on October 13, 2006.

Table 1, "Indications for B1R14 Pressurizer Weld Overlays (Pre-Weld Repairs)", provides detailed results of the initial UT inspections performed on the aforementioned pressurizer nozzles. The following is a summary of the results:

Nozzle	Number of Flaw Indications	Flaw Indication Assessment Summary
Safety "A"	2 Planar Indications	One planar indication was unacceptable. Both planar indications were removed in the repair excavation (See Attachment 1).
Safety "B"	No Recordable Indications	
Safety "C"	9 Laminar Indications and 7 Planar Indications	Four (4) laminar indications were unacceptable due to associated assumed flaws. Two (2) assumed flaws associated with laminar indications were found to be acceptable per IWB-3640. Six (6) laminar indications were removed in the repair excavation (See Attachment 2, page 1). All seven (7) planar indications were unacceptable and were removed in the repair excavation (See Attachment 2, page 2).
PORV	3 Laminar Indications and 3 Planar Indications	All three (3) laminar indications were acceptable. Two (2) Planar indications were unacceptable and were removed in the repair excavation (See Attachment 3).
SPRAY	No Recordable Indications	
SURGE	7 Laminar Indications	All seven (7) laminar indications were acceptable.

As indicated above, the Safety "A", Safety "C" and PORV Nozzles had flaw indications that were determined to be unacceptable. Weld material excavation and repairs of these nozzles were performed (See Attachments 1, 2, and 3 for repair excavation areas and encompassed flaw indications). Table 2, "Indications for B1R14 Pressurizer Weld Overlays (Post-Weld Repairs)", provides detailed results of the final UT inspections performed on the Safety "A", Safety "C" and PORV Nozzles following weld repairs. The following is a summary of the results:

Nozzle	Number of Flaw Indications	Flaw Indication Assessment Summary
Safety "A"	1 Laminar Indication and 1 Planar Indication	All indications were found to be acceptable.
Safety "C"	No Recordable Indications	
PORV	No Recordable Indications	

Should you have any questions concerning this letter, please contact William Grundmann at (815) 406-2800.

Respectfully,



David M. Hoots
Site Vice President
Byron Station

DMH/JEL/rah

Attachments: Table 1 – Indications for B1R14 Pressurizer Weld Overlays (Pre-Weld Repairs), 3 pages.
Table 2 - Indications for B1R14 Pressurizer Weld Overlays (Post-Weld Repairs), 1 page.
Attachment 1 – Safety “A” Nozzle Weld Repair Area, 1 page.
Attachment 2 - Safety “C” Nozzle Weld Repair Area, 2 pages.
Attachment 3 - PORV Nozzle Weld Repair Area, 1 page.

Table 1
Indications for B1R14 Pressurizer Weld Overlays
(Pre-Weld Repairs)

NOZZLE ID	INDICATION NUMBER	INDICATION TYPE	UT MEASURED DEPTH FROM OUTSIDE SURFACE TO CENTER OF FLAW IND.	UT MEASURED LENGTH OF FLAW INDICATION MEASURED ON OD	UT MEASURED POSITION OF FLAW INDICATION FROM REFERENCE MARK (As Marked on Sketches)	UT MEASURED CIRCUMF. POSITION OF FLAW INDICATION IN INCHES FROM 0 REFERENCE POINT (Note 2)	UT MEASURED HEIGHT OF FLAW IND.	AVERAGE THICKNESS OF OVERLAY IN LOCATION OF FLAW INDICATION (Note 4)	UT MEASURED WIDTH OF LAMINAR FLAW IND.	INDICATION DISPOSITION						FLAW INDICATION INCLUDED IN REPAIR EXCAVATION AREA	REMARKS
										Table IWB-3514-3 (Square Inches)	<10% Reduction In Coverage Per Appendix Q Q-4100(c)(2) (Note 5)	IWB-3514-2 Inservice Examination for assumed flaws	IWB-3514-2 Preservice Examination	Flaw Propagation in outer 25% of underlying weld/ base metal Per Appendix Q Q-4200(a)	IWB-3640 Eval. for assumed flaw Per Appendix Q Q-4100(c)(3)		
SAFETY A	1	Planar	0.2"	1.75"	6.5"	-3.0"	No Measurable Depth	.67"	N/A	N/A No Laminar Flaws	Acceptable: DM Weld Circ.: 0.0% Max. Axial: 1.84% Max. SS Weld, No RIC	Acceptable: No Uninspectable volumes & No postulated radial flaws	Acceptable: Minimal (non-measurable) through wall dimension	No Indications found in outer 25%	N/A	YES	Repair Needed, See Attachment 1
	2	Planar	0.50"	4.0"	5.0"	-2.0"	0.31"	0.70"	N/A	N/A No Laminar Flaws		Acceptable: No Uninspectable volumes & No postulated radial flaws	Unacceptable: 20.7% Actual vs. 8.8% Allowable.		N/A	YES	Repair Needed See Attachment 1
SAFETY B	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	N/A	N/A	N/A	N/A	No Indications found in outer 25%	N/A	N/A	
SAFETY C	1	Laminar	0.79"	4.85"	4.2"	0"	0	0.81"	0.25"	Acceptable: 1.0" vs. 7.5" allow.	Acceptable: DM Weld Circ.: 2.73% Max. Axial: 7.96% Max. SS Weld Circ.: 0.20% Max. Axial: 1.17% Max.	The laminar flaw indication is at the overlay/base metal interface, therefore, there is no uninspectable volume.	N/A Laminar Flaw	No Indications found in outer 25%	N/A	YES	Repair Needed See Attachment 2, Repair Area # 2
	2	Laminar	0.24"- 0.33"	2.50"	4.8"	7.9"	0	0.86"	0.30"	Acceptable: 0.7" vs. 7.5" allow.			N/A Laminar Flaw			YES	Repair Needed See Attachment 2, Repair Area # 2
	3	Laminar	0.275"- 0.285"	5.4"	7.1"	7.4"	0	0.93"	0.25"	Acceptable: 1.3" vs. 7.5" allow.			N/A Laminar Flaw			YES	Repair Needed See Attachment 2, Repair Area # 1
	4	Laminar	0.20"	1.20"	3.3"	13.0"	0	0.72"	0.25"	Acceptable: 0.3" vs. 7.5" allow.			N/A Laminar Flaw		Acceptable: Act. 2a/t= 0.31 Allowable 2a/t per C-5410-1 = 0.75	NO	
	5	Laminar	0.23"	2.5"	11.5"	12.4"	0	0.48"	0.50"	Acceptable: 1.2" vs. 7.5" allow.			N/A Laminar Flaw		Acceptable: Act. 2a/t= 0.40 Allowable 2a/t per C-5410-1 = 0.70	NO	
	6	Laminar	0.15"	0.90"	8.85"	-7.90"	0	0.69"	0.20"	Acceptable: 0.2" vs. 7.5" allow.			N/A Laminar Flaw			YES	Repair Needed See Attachment 2, Repair Area # 3
	7	Laminar	0.18"	0.90"	7.3"	-11.0"	0	0.97"	0.40"	Acceptable: 0.3" vs. 7.5" allow.			N/A Laminar Flaw			YES	Repair Needed See Attachment 2, Repair Area # 3
	8	Laminar	0.39"	2.25"	7.0"	-6.7"	0	0.87"	0.25	Acceptable: 0.5" vs. 7.5" allow.			N/A Laminar Flaw			YES	Repair Needed See Attachment 2, Repair Area # 3
	9	Laminar	0.38"	0.9"	4.7"	-7.2"	0	0.80"	0.30"	Acceptable: 0.2" vs. 7.5" allow.			N/A Laminar Flaw			NO	
												Acceptable: Circ.: 6.3 Act. vs. 11.1 Allowable Acceptable: Axial: 10.0 Act. vs. 11.8 Allowable					

Table 1
Indications for B1R14 Pressurizer Weld Overlays
(Pre-Weld Repairs)

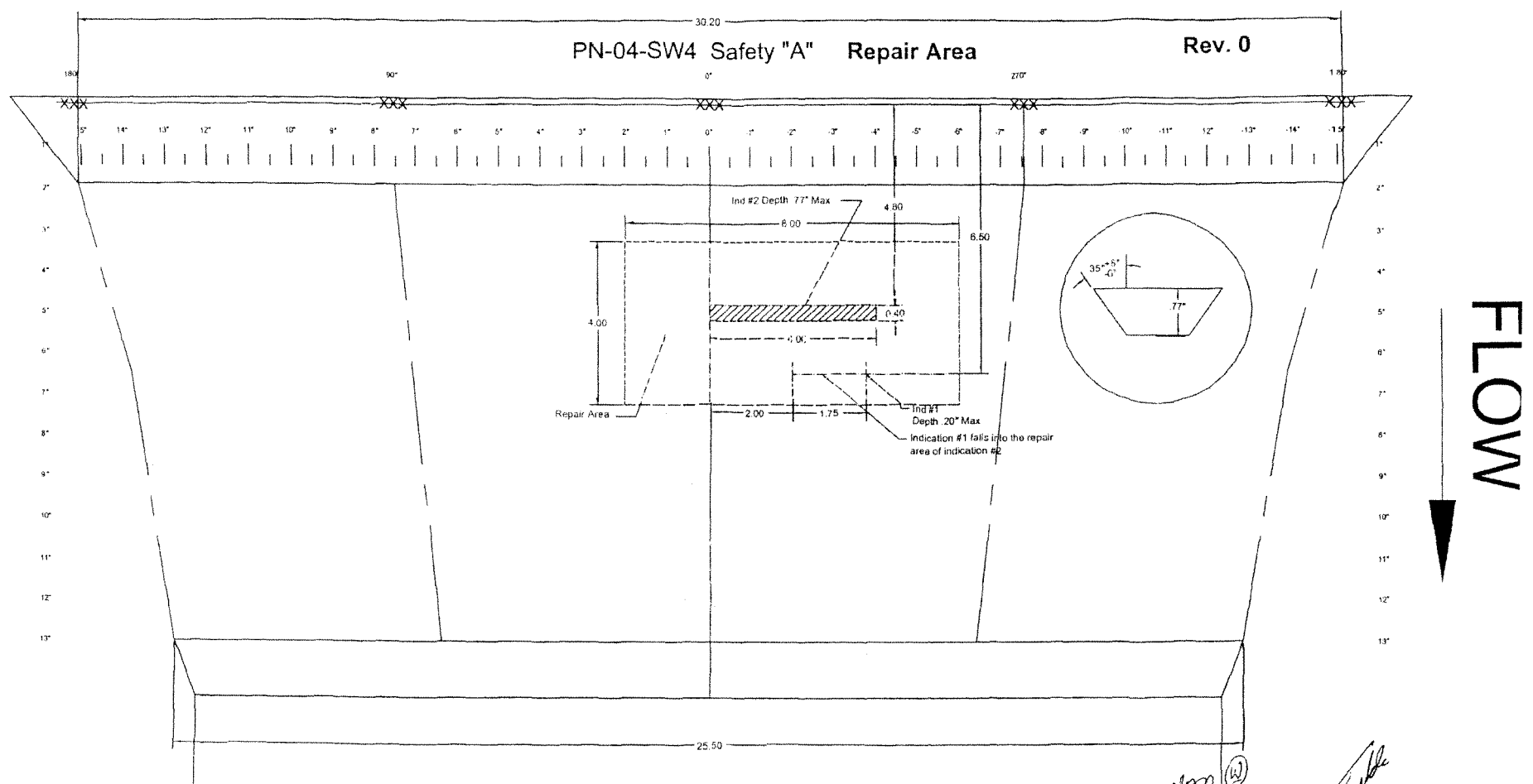
NOZZLE ID	INDICATION NUMBER	INDICATION TYPE	UT MEASURED DEPTH FROM OUTSIDE SURFACE TO CENTER OF FLAW IND.	UT MEASURED LENGTH OF FLAW INDICATION MEASURED ON OD	UT MEASURED POSITION OF FLAW INDICATION FROM REFERENCE MARK (As Marked on Sketches)	UT MEASURED CIRCUMF. POSITION OF FLAW INDICATION IN INCHES FROM 0 REFERENCE POINT (Note 2)	UT MEASURED HEIGHT OF FLAW IND.	AVERAGE THICKNESS OF OVERLAY IN LOCATION OF FLAW INDICATION (Note 4)	UT MEASURED WIDTH OF LAMINAR FLAW IND.	INDICATION DISPOSITION						FLAW INDICATION INCLUDED IN REPAIR EXCAVATION AREA	REMARKS
										Table IWB-3514-3 (Square Inches)	<10% Reduction In Coverage Per Appendix Q Q-4100(c)(2) (Note 5)	IWB-3514-2 Inservice Examination for assumed flaws	IWB-3514-2 Preservice Examination	Flaw Propagation in outer 25% of underlying weld/ base metal Per Appendix Q Q-4200(a)	IWB-3640 Eval. for assumed flaw Per Appendix Q Q-4100(c)(3)		
SAFETY C	1A	Planar	0.23"	6.8"	7.65"	9.3"	0.180"	0.92"	N/A	N/A	Acceptable: DM Weld Circ.: 2.73% Max. Axial: 7.96% Max. SS Weld Circ.: 0.20% Max. Axial: 1.17% Max.	Acceptable: No Postulated Radial Planar Flaws	Unacceptable: 9.8% Act. vs. 8.6% Allowable	No Indications found in outer 25%		YES	Repair Needed See Attachment 2, Repair Area # 1
	2A	Planar	0.389"	2.95"	5.15"	8.3"	0.35"	0.85"	N/A	N/A		Acceptable: No Postulated Radial Planar Flaws	Unacceptable: 20.6 Act. vs. 8.8 Allowable			YES	Repair Needed See Attachment 2, Repair Area # 2 Combined w/Ind. 7A
	3A	Planar	0.65"	4.8"	3.85"	2.75"	0.243"	0.53"	N/A	N/A		Acceptable: No Postulated Radial Planar Flaws	Unacceptable: 22.6 Act. vs. 9.2 Allowable			YES	Repair Needed See Attachment 2, Repair Area # 2
	4A	Planar	0.32"	4.2"	3.95"	4.75"	0.14"	0.84"	N/A	N/A		Acceptable: No Postulated Radial Planar Flaws	Unacceptable: 10.0 Act. vs. 8.9 Allowable			YES	Repair Needed See Attachment 2, Repair Area # 2
	5A	Planar	0.35"	3.75"	7.8"	-8.0"	0.25"	0.91"	N/A	N/A		Acceptable: No Postulated Radial Planar Flaws	Unacceptable: 13.7 Act. vs. 8.7 Allowable			YES	Repair Needed See Attachment 2, Repair Area # 3
	6A	Planar	0.40"	1.7"	7.0"	-5.0"	0.16"	0.85"	N/A	N/A		Acceptable: No Postulated Radial Planar Flaws	Unacceptable: 9.4 Act. vs. 8.8 Allowable			YES	Repair Needed See Attachment 2, Repair Area # 3
	7A	Planar	0.33"	2.70"	5.2"	8.1"	0.14"	0.87"	N/A	N/A		Acceptable: No Postulated Radial Planar Flaws	Unacceptable: 20.6 Act. vs. 8.8 Allowable			YES	Repair Needed See Attachment 2, Repair Area # 2. Combined w/Ind. 2A
PORV	1	Laminar	0.312"	0.80"	4.65"	-5.4"	0	0.90"	0.30"	Acceptable: 0.6 Act. vs. 7.5 Allowable	Acceptable: DM Weld Circ.: 0.36% Max. Axial: 1.71% Max. SS Weld No RiC	Acceptable: Axial: 7.9% Actual vs. 11.6% Allowable Circ.: 5.6% Actual vs. 11.0% Allowable	N/A	No Indications found in outer 25%	None	NO	Combined w/Ind. 2
	2	Laminar	0.290"	0.40"	4.85"	-6.50"	0	0.90"	0.30"	Acceptable: 0.6 Act. vs. 7.5 Allowable		Acceptable: Axial: 4.4% Actual vs. 11.2% Allowable Circ.: 5.0% Actual vs. 11.2% Allowable	N/A		None	NO	Combined W/Ind. 1
	3	Laminar	0.47"	0.75"	3.85"	-8.82"	0	0.96"	0.30"	Acceptable: 0.2 Act. vs. 7.5 Allowable		Acceptable: Axial: 5.6% Actual vs. 11.1% Allowable Circ.: 4.2% Actual vs. 10.8% Allowable	N/A		None	NO	
	1A	Planar	0.30"	5.0"	7.8"	-7.0"	0.03"	0.6"	N/A	N/A		N/A	Acceptable: 2.5% Actual vs. 9.0% Allowable		None	NO	
	2A	Planar	0.61"	9.5"	4.5"	4.6"	0.70"	0.8"	N/A	N/A		N/A	Unacceptable: 21.3% Actual vs. 8.8% Allowable		None	YES	Repair Needed See Attachment 3
	3A	Planar	0.67"	4.0"	6.25"	6.35"	0.80"	0.90"	N/A	N/A		N/A	Unacceptable: 18.8% Actual vs. 9.9% Allowable		None	YES	Repair Needed See Attachment 3

Table 1
Indications for B1R14 Pressurizer Weld Overlays
(Pre-Weld Repairs)

NOZZLE ID	INDICATION NUMBER	INDICATION TYPE	UT MEASURED DEPTH FROM OUTSIDE SURFACE TO CENTER OF FLAW IND.	UT MEASURED LENGTH OF FLAW INDICATION MEASURED ON OD	UT MEASURED POSITION OF FLAW INDICATION FROM REFERENCE MARK (As Marked on Sketches)	UT MEASURED CIRCUMF. POSITION OF FLAW INDICATION IN INCHES FROM 0 REFERENCE POINT (Note 2)	UT MEASURED HEIGHT OF FLAW IND.	AVERAGE THICKNESS OF OVERLAY IN LOCATION OF FLAW INDICATION (Note 4)	UT MEASURED WIDTH OF LAMINAR FLAW IND.	INDICATION DISPOSITION						FLAW INDICATION INCLUDED IN REPAIR EXCAVATION AREA	REMARKS
										Table IWB-3514-3 (Square Inches)	<10% Reduction In Coverage Per Appendix Q Q-4100(c)(2) (Note 5)	IWB-3514-2 Inservice Examination for assumed flaws	IWB-3514-2 Preservice Examination	Flaw Propagation in outer 25% of underlying weld/ base metal Per Appendix Q Q-4200(a)	IWB-3640 Eval. for assumed flaw Per Appendix Q Q-4100(c)(3)		
SPRAY	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	N/A	N/A	N/A	N/A	No Indications found in outer 25%	N/A	N/A	
SURGE	1	Laminar	0.86"	9.5"	9.5"	5.6"	0	0.80"	0.30"	Acceptable: 2.5" vs. 7.5" allow.	Acceptable: DM Weld Circ.: 1.43% Max. Axial: 2.65% Max. SS Weld Circ.: 0.71% Max. Axial: 1.41% Max.	Acceptable: All laminar flaw indications lie at or near the overlay/base metal interface, therefore, there is no uninspectable volume.	Acceptable: N/A No Planar Flaw Indications found in the PSI/ISI Examination Volumes.	No Indications found in outer 25%	None	NO	
	2	Laminar	0.85"	5.85"	5.9"	6.0"	0	0.83"	0.40"	Acceptable: 2.1" vs. 7.5" allow.		Acceptable: All laminar flaw indications lie at or near the overlay/base metal interface, therefore, there is no uninspectable volume.	Acceptable: N/A No Planar Flaw Indications found in the PSI/ISI Examination Volumes.		None	NO	
	3	Laminar	0.85"	4.25"	5.9"	12.8"	0	0.75"	0.40"	Acceptable: 1.5" vs. 7.5" allow.		Acceptable: All laminar flaw indications lie at or near the overlay/base metal interface, therefore, there is no uninspectable volume.	Acceptable: N/A No Planar Flaw Indications found in the PSI/ISI Examination Volumes.		None	NO	
	4	Laminar	0.89"	3.75"	5.9"	22.0"	0	0.85"	0.30"	Acceptable: 1.0" vs. 7.5" allow.		Acceptable: All laminar flaw indications lie at or near the overlay/base metal interface, therefore, there is no uninspectable volume.	Acceptable: N/A No Planar Flaw Indications found in the PSI/ISI Examination Volumes.		None	NO	
	5	Laminar	0.82"	3.75"	5.7"	50"	0	0.80"	0.35"	Acceptable: 1.2" vs. 7.5" allow.		Acceptable: All laminar flaw indications lie at or near the overlay/base metal interface, therefore, there is no uninspectable volume.	Acceptable: N/A No Planar Flaw Indications found in the PSI/ISI Examination Volumes.		None	NO	
	6	Laminar	0.81"	0.70"	6.0"	-8.0"	0	0.83"	0.40"	Acceptable: 0.3" vs. 7.5" allow.		Acceptable: All laminar flaw indications lie at or near the overlay/base metal interface, therefore, there is no uninspectable volume.	Acceptable: N/A No Planar Flaw Indications found in the PSI/ISI Examination Volumes.		None	NO	
	7	Laminar	0.82"	0.90"	6.25"	-12.0"	0	0.85"	0.30"	Acceptable: 0.2" vs. 7.5" allow.		Acceptable: All laminar flaw indications lie at or near the overlay/base metal interface, therefore, there is no uninspectable volume.	Acceptable: N/A No Planar Flaw Indications found in the PSI/ISI Examination Volumes.		None	NO	
NOTES:														ABBREVIATIONS			
1 All flaw indications are in the circumferential direction.														RiC - Reduction in Coverage			
2 Zero reference point for circumferential dimensions are top dead center of weld for Relief, Safety. The surge and spray was the adjacent elbow extrados. Minus (-) dimensions are counter clockwise direction.														DM - Nozzle to Safe-End Weld			
3 The Nominal diameters of the components are as follows: Safeties/PORV: 6.0", Spray 4.0", Surge: 14.0"														SS- Safe End to Pipe Weld			
4 Measured from the weld overlay OD surface perpendicular to the pipe axis to the weld overlay/base metal interface using the nearest cross-section profile.																	
5 Reduction in coverage shows the total reduction for both the nozzle to safe-end and safe-end to pipe welds. Reduction in coverage values for individual flaws are not shown. Reduction in coverage for axial and circumferential direction is calculated separately per the requirements of EPRI MRP-139 Paragraph 5.1.5.																	

Table 2
Indications for B1R14 Pressurizer Weld Overlays
(Post-Weld Repairs)

NOZZLE ID	INDICATION NUMBER	INDICATION TYPE	UT MEASURED DEPTH FROM OUTSIDE SURFACE TO CENTER OF FLAW IND.	UT MEASURED LENGTH OF FLAW INDICATION MEASURED ON OD	UT MEASURED POSITION OF FLAW INDICATION FROM REFERENCE MARK (As Marked on Sketches)	UT MEASURED CIRCUMF. POSITION OF FLAW INDICATION IN INCHES FROM 0 REFERENCE POINT (Note 2)	UT MEASURED HEIGHT OF FLAW IND.	AVERAGE THICKNESS OF OVERLAY IN LOCATION OF FLAW INDICATION (Note 4)	UT MEASURED WIDTH OF LAMINAR FLAW IND.	INDICATION DISPOSITION						FLAW INDICATION INCLUDED IN REPAIR EXCAVATION AREA	REMARKS
										Table IWB-3514-3 (Square Inches)	<10% Reduction In Coverage Per Appendix Q Q-4100(c)(2) (Note 5)	IWB-3514-2 Inservice Examination for assumed flaws	IWB-3514-2 Preservice Examination	Flaw Propagation in outer 25% of underlying weld/ base metal Per Appendix Q Q-4200(a)	IWB-3640 Eval. for assumed flaw Per Appendix Q Q-4100(c)(3)		
SAFETY A	1	Laminar	0.61"	2.1"	3.20"	-1.7"	0	.67"	0.4	Acceptable 0.7" vs. 7.5" allow.	There is no reduction in coverage to the PSI/IS examination volumes due to the laminar flaw indication	Acceptable: Circ.: 6.4 Act. vs. 11.2 Allowable Acceptable: Axial: 5.0 Act. vs. 11.3 Allowable	N/A	No Indications found in outer 25%	N/A	N/A No Repair Needed	
	1A	Planar	0.62"	2.1"	3.65"	-2.6"	0.11"	.63"	N/A	N/A		N/A	Acceptable 8.7% Actual vs. 9.0% Allowable		N/A	N/A No Repair Needed	
SAFETY C	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	N/A	N/A	N/A	N/A	No Indications found in outer 25%	N/A	NO	
PORV	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	No Indications	N/A	N/A	N/A	N/A	No Indications found in outer 25%	N/A	NO	
NOTES:																ABBREVIATIONS	
1 All flaw indications are in the circumferential direction.																RiC - Reduction in Coverage	
2 Zero reference point for circumferential dimensions are top dead center of weld for Relief, Safety. The surge and spray was the adjacent elbow extrados. Minus (-) dimensions are counter clockwise direction.																DM - Nozzle to Safe-End Weld	
3 The Nominal diameters of the components are as follows: Safeties/PORV: 6.0", Spray 4.0", Surge: 14.0"																SS- Safe End to Pipe Weld	
4 Measured from the weld overlay OD surface perpendicular to the pipe axis to the weld overlay/base metal interface using the nearest cross-section profile.																	
5 Reduction in coverage shows the total reduction for both the nozzle to safe-end and safe-end to pipe welds. Reduction in coverage values for individual flaws are not shown. Reduction in coverage for axial and circumferential direction is calculated separately per the requirements of EPRI MRP-139 Paragraph 5.1.5.																	



C. R. Hammond 10/1/06

EXCEL
PROGRAMS

10/1/06

Jefferson 10/1/06 (W)

[Signature]
10/1/06

