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2014-115_____BWR Vessel & Internals Project (BWRVIP)

(by e-mail)

August 7, 2014

Document Control Desk
U. S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Attention: Joseph Holonich

Subject: Project No. 704 – BWR Vessel and Internals Inspection Summaries for Fall 2013 Outages

Enclosed are five (5) copies of the document entitled "BWR Vessel and Internals Project, Vessel Internals Inspection Summaries for Fall 2013 Outages, June 2014."

The information provided in the enclosed document identifies the BWR internal components inspected and generally includes the date or frequency of inspection, the inspection method used and a summary of results including repair or replacement activities. The enclosed document is being provided to the NRC for information only.

The information contained in the enclosed document was developed by the individual utilities and has been compiled into the enclosed document by the BWRVIP. The BWRVIP plans to continue to gather such information and to provide periodic updates such as in the enclosed document.

Representatives of the BWRVIP would be pleased to meet with the NRC staff to discuss any comments or questions related to the enclosed document. If you have any questions on the enclosed document or the general subject of inspection results, please call Drew Odell, BWRVIP Integration Committee Technical Chairman, Exelon, 610.765.5483.

Sincerely,

A. O. McGehee Tim Hanley

Andrew McGehee, EPRI, BWRVIP Program Manager
Tim Hanley, Exelon, BWRVIP Chairman

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BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Fall 2013 Outages

June 2014

Table of Contents

Reactor Internals Inspection History

Plant: **Clinton Power Station**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud			
Horizontal Welds H1, H2, H3, H4, H5, H6A, H6B, and H7. Vertical Welds V11, V12, V13 and V14	4/2002 (C1R08)	UT	Performed UT of Horizontal Welds. Coverage: Weld Number — % of Examined Length H1 — 59.7% H2 — 67.4% H3 — 66.7% H4 upper side — 100.0% H4 lower side — 97.1% H5 upper side — 19.0% H5 lower side — 18.7% H6A — 16.4% H6B — 25.6% H7 — 26.5% V11 — 95.2% V12 — 95.0% V13 — 87.0% V14 — 87.0% The following identify flaws: Weld Number — % of Examined Length Flawed H1 — 0.0% H2 — 0.0%

<table>
<tr><td></td><td></td><td></td><td colspan="3">H3 19.1%
H4 upper side 97.2%
H4 lower side 74.0%
H5 upper side 15.3%
H5 lower side 0.0%
H6A 0.0%
H6B 5.4%
H7 0.0%

V11 0.0%
V12 0.0%
V13 0.0%
V14 0.0%</td></tr>
<tr><td>Horizontal Welds H1, H2, H3, H4, H5, H6A, H6B, and H7.
Vertical Welds V11, V12, V13 and V14</td><td>4/2002 (C1R08)</td><td>UT</td><td colspan="3">Prior to startup an Engineering Evaluation was performed to justify continued operation for one cycle. Later on several other analyses performed as identified in VIP documents to document 2 cycles of operation. This plan was presented to the NRC.

Planning to implement a repair modification in 2/2006 (C1R10).</td></tr>
<tr><td>4 Tie Rods</td><td>2/2006 (C1R10)</td><td>Visual Inspection</td><td colspan="3">4 Tie Rods installed in 2/2006 (C1R10). Inspection performed as required by VIP-76.</td></tr>
<tr><td rowspan="4">Vertical Welds: V4, V5, V15, V16, V20, V21, V22, and V23</td><td rowspan="4">01/2008 (C1R11)</td><td rowspan="4">Visual Inspection</td><td colspan="3">Performed Visual Examination of the following Vertical Welds.
Coverage:</td></tr>
<tr><td>Weld Number Length</td><td>% of Examined Length</td><td>Inspection Results</td></tr>
<tr><td>V4 (OD Only)</td><td>100.0%</td><td>Acceptable</td></tr>
<tr><td>V5 (OD Only)</td><td>10.0%</td><td>Inspected 100% accessible area, but because out of correct angle due to this weld is right behind the LPCI line, except for the top area of the weld). Acceptable.</td></tr>
</table>

			V15 (OD Only)	10.0%	Tie Rod limits access to weld, changed 25% to 10%. Acceptable.
			V16 (OD Only)	50.0%	Top portion of the weld is hidden by Tie Rod. Acceptable.
			V20 (OD Only)	100.0%	Acceptable
			V21 (OD Only)	95.0%	Acceptable
			V22 (OD Only)	100.0%	Acceptable
			V23 (OD Only)	100.0%	Acceptable
Detail inspection of 2 Tie Rods at 65 deg. and 245 deg.	01/2008 (C1R11)	Detail Visual including tightness verification	Tie Rod at 65 deg. - Acceptable Tie Rod at 245 deg. - Acceptable		
General inspection of the remaining 2 Tie Rods at 155 and 335 deg.	01/2008 (C1R11)	Visual Inspection	Tie Rod at 155 deg. - Acceptable Tie Rod at 335 deg. - Acceptable		
Detail inspection of 2 Tie Rods at 155 deg. and 335 deg.	01/2010 (C1R12)	Detail Visual including tightness verification	Tie Rod at 155 deg. - Acceptable Tie Rod at 335 deg. - Acceptable Inspection required by BWRVIP-76 & Tie Rod Design.		
General inspection of the remaining 2 Tie Rods at 65 and 245 deg.	01/2010 (C1R12)	Visual Inspection	Tie Rod at 65 deg. - Acceptable Tie Rod at 245 deg. - Acceptable Inspection required by BWRVIP-76 & Tie Rod Design.		
Vertical Welds V11, V12, V13 and V14	12/2011 (C1R13)	UT	Performed UT of Vertical Welds. Coverage: Weld Number Length / % of Examined Length V11 84.0% V12 80.7% V13 81.7% V14 85.3% The following identify flaws: Weld Number Length / % of Examined Length Flawed V11 1.1% V12 0.0% V13 0.0% V14 0.0%		

Tie Rod at 65 deg	12/2011 (C1R13)	VT-3	No indications identified.
Tie Rod at 65 deg Upper Support Corners	12/2011 (C1R13)	EVT-1	No indications identified.
Tie Rod at 65 deg Upper Support Corners	12/2011 (C1R13)	EVT-1	No indications identified.
Shroud Vert Welds: V4, V5, V15, V16, V20, V21, V22, and V23	10/2013 (C1R14)	EVT-1	Performed Visual Examination of the following Vertical Welds. Coverage: Weld Number / Length: % of Examined Length: Inspection Results V4 ID: 10.00%: Acceptable. Core spray piping and spargers limit exam areas V4 OD: 70.00%: Acceptable V5 ID: 55.00%: Acceptable V5 OD: 20.00%: Acceptable. LPCI piping obstructs exam area. V15 ID: 0.00%: V15 is inaccessible due to core configuration at 165 deg. V15 OD: 25.00%: Acceptable V16 ID: 0.00%: V16 is inaccessible due to core configuration at 345 deg. V16 OD: 60.00%: Acceptable V20 (OD Only): 85.00%: Acceptable V21 (OD Only): 90.00%: Acceptable V22 (OD Only): 100.00%: Acceptable V23 (OD Only): 100.00%: Acceptable

Shroud Support			
H8 and H9 Welds	10/2000 (C1R07)	EVT-1	EVT-1 of H8 and H9 welds for >10% length per VIP-38. No indications were identified.
H9 Weld	2/2004 (C1R09)	UT	UT of H9 weld for 100% length from outside the Reactor wall. No indications were identified.
H8 Weld	2/2006 (C1R10)	EVT-1	No indications were identified.
Access Hole Cover	2/2004 (C1R09)	VT-1	VT-1 of Access Hole Cover assembly per GE SIL 462. No indications were identified.
	1/2010 (C1R12)	EVT-1	EVT-1 of Access Hole Cover and Heat Affected Zone (HAZ). No indications were identified. Inspection required by BWRVIP-180.
H8 Weld	12/2011 (C1R13)	EVT-1 & VT-1	No indications were identified.
H9 Weld	10/2013 (C1R14)	UT	UT of H9 weld for 100% length from outside the Reactor wall. No indications were identified.
Core Spray Baseline Inspection			
Core Spray Piping: P2, P3A, P3B, P4A, P4B, P5, and P6	10/2000 (C1R07)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and Low Pressure Core Spray piping systems. Two flaw indications, one on each BP2 and CP2 welds, were identified. Evaluated for 2 cycles operation per Core Spray Flaw Evaluation Handbook.
P4C and P4D	10/2000 (C1R07)	EVT-1	No indications were identified.
P8	10/2000 (C1R07)	VT-1	No indications were identified.
Core Spray Baseline Inspection			
Core Spray Spargers	10/2000 (C1R07)	EVT-1/ VT-1 (as required)	No indications were identified.
Core Spray Reinspection			
Core Spray Piping: P2's-all 4, P3A's-all 4, P3B-only 1, P4A-only 1, P4B-only 1, P5's-all 4, and P6-only 1.	2/2004 (C1R09)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and Low Pressure Core Spray piping systems. The two (2) existing flaw indications, one on each BP2, CP2 welds, were identified. These two (2) flaws grew in length. Evaluated for 2 additional cycles of operation per Core Spray Flaw Evaluation Handbook. In addition, one more flaw indication on weld DP2 was identified. This flaw indication was also evaluated for two (2) cycles of operation. No other indications were identified.

P4c-only 1 weld P4d-only 1 weld P8-only 1	2/2004 (C1R09)	EVT-1	No indications were identified.
A-PR, A-ADR, A-BDR, B-PR, B-CDR, and B-DDR	2/2004 (C1R09)	EVT-1	No indications were identified.
Core Spray Spargers	2/2004 (C1R09)	EVT-1/VT-1 (as required) Auto UT and EVT-1	No indications were identified.
A-PR, A-ADR, A-BDR, B-PR, B-CDR, B-DDR	2/2006 (C1R10)	EVT-1	No indications were identified.
A-BP4c, A-BP4d A-APB(PB1) A-BPB(PB2)	2/2006 (C1R10)	EVT-1	No indications were identified.
A-BP8	2/2006 (C1R10)	VT-1	No indications were identified.
Core Spray Piping: P2's-all 4, P3A's-all 4, P3B-only 1, P4A-only 1, P4B-only 1, P5's-all 4, and P6-only 1.	01/2008 (C1R11)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and Low Pressure Core Spray piping systems. The three (3) existing flaw indications, one on each BP2, CP2, and DP2 were identified. These three (3) flaws did not grow in last two (2) cycles. The previous evaluation for 2 additional cycles of operation is still valid per Core Spray Flaw Evaluation Handbook. No other relevant indications were identified.
A-PR, A-ADR, A-BDR, B-PR, B-CDR and B-DDR	01/2008 (C1R11)	EVT-1	No indications were identified.
A-AP2, A-AP5, A-BP2, A-BP3B, A-BP6, B-CP2, and B-DP2	01/2008 (C1R11)	EVT-1	No indications were identified.
A-APB(PB1), A-BPB(PB2), B-CPB(PB3), B-DPB(PB4)	01/2008 (C1R11)	EVT-1	No indications were identified.

B-CP8 - 187 deg.	01/2008 (C1R11)	VT-1	No indications were identified.
Core Spray Spargers	01/2008 (C1R11)	EVT-1/VT-1 (as required)	No indications were identified.
Grinding marks and evidence of cold work (except for P3a and P5)	01/2008 (C1R11)	VT-1	No specific grinding marks or evidence of cold work identified.
A-AP2, A-PR A-ADR, A-BP2, A-BDR, B-PR B-CP2, B-CDR B-CP3b, B-CP4c B-CP4d, B-CP6 B-DP2, B-DDR B-DP8	1/2010 (C1R12)	EVT-1	No indications were identified. Inspection performed per BWRVIP-18.
A-AP2, A-PR A-ADR, A-BP2, A-BDR, A-AP8, B-PR, B-CP2, B-DP2 B-CDR, B-CP3b, B-CP6, B-DDR	12/2011 (C1R13)	EVT-1	No indications were identified. Inspection performed per BWRVIP-18.
A-APB(PB1), A-BPB(PB2),	12/2011 (C1R13)	EVT-1	No indications were identified.
Core Spray Spargers	12/2011 (C1R13)	EVT-1/VT-1 (as required)	No indications were identified.
Core Spray Piping: P2's-all 4, P3A's-all 4, P3B-only 1, P4A-only 1, P4B-only 1, P5's-all 4, and P6-only 1.	12/2011 (C1R13)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and Low Pressure Core Spray piping systems. The three (3) existing flaw indications, one on each BP2, CP2, and DP2 were identified. These three (3) flaws grew in last two (2) cycles. Evaluated for 2 additional cycles of operation per Core Spray Flaw Evaluation Handbook. No other relevant indications were identified.
A-ADR, A-AP2, A-BDR, A-BP2, A-PR, B-CDR, B-CP2, B-DDR, B-DP2, B-DP4c, B-DP4d, B-PR	10/2013 (C1R14)	EVT-1	No indications were identified. Inspection performed per BWRVIP-18.
A-BP8		VT-1	

Top Guide			
Hold Down Assembly including Bolts and Nuts	2/2004 (C1R09)	VT-3	Performed VT-3 of the Top Guide including Bolts and Nuts. No indications were identified.
Hold Down Assembly including Bolts and Nuts	12/2011 (C1R13)	VT-3	Performed VT-3 of the Top Guide Studs, Bolts and Nuts. No indications were identified.
Top Guide Cell	1/2010 (C1R12)	EVT-1	Two cells visually inspected per VIP-183. No indications were identified.
Top Guide Rim Weld	1/2010 (C1R12)	EVT-1	Inspected at 0 and 180 degrees. No indications were identified.
Core Plate (Rim, etc.)	N/A	N/A	N/A
Standby Liquid Control (SLC)	N/A	N/A	N/A
Jet Pumps			
High Priority Welds RS-3 Welds (50%)	10/2000 (C1R07)	EVT-1	Performed EVT-1 of remaining High Priority welds. No indications were identified.
	2/2004 (C1R09)	EVT-1	Performed EVT-1 of remaining High Priority welds. No indications were identified.
	1/2010 (C1R12)	EVT-1	Performed EVT-1 of remaining High Priority welds. No indications were identified.
Medium Priority RS-1 Welds (50%)	4/2002 (C1R08)	EVT-1	Performed EVT-1 of remaining Medium Priority welds. No indications were identified.
	01/2008 (C1R11)	EVT-1	A gouge was identified outside the exam area of RS-1 JP#8.
RS-1 Welds (25%)	10/2013 (C1R14)	EVT-1	Performed EVT-1 on JP-1/2, JP-3/4, JP-7/8. No indications were identified.
Riser Welds RS-2, RS-6, RS-7 RS-8, and RS-9 (50%)	2/2004 (C1R09)	EVT-1	No indications were identified.
	01/2008 (C1R11)	EVT-1	No indications were identified.
Riser Welds RS-8, and RS-9 (50%)	01/2010 (C1R12)	EVT-1	Ten RS-8 and ten RS-9 welds were inspected. No indications were identified.
Riser Brace RB-1a,b,c,d and RB-2a,b,c,d (50%)	2/2004 (C1R09)	EVT-1	No indications were identified.
	01/2008 (C1R11)	EVT-1 & VT-1	No indications were identified.
	01/2010 (C1R12)	EVT-1	No indications were identified.
Riser Brace RB-1a,b,c,d and RB-2a,b,c,d (25%)	10/2013 (C1R14)	EVT-1	Performed EVT-1 on JP-1, JP-2, JP-3, JP-4, JP-15, JP-16. No indications were identified.

Inlet Mixer IN-1 and IN-2 welds (50%)	2/2004 (C1R09)	EVT-1	No indications were identified.
	01/2008 (C1R11)	EVT-1	No indications were identified.
Inlet Mixer IN-1 and IN-2 welds (25%)	10/2013 (C1R14)	EVT-1	JP-1, JP-2, JP-3, JP-4, JP-15, and JP-16. No indications were identified.
Sensing Lines (50%)	2/2004 (C1R09)	VT-1	No indications were identified.
	01/2008 (C1R11)	VT-1	No indications were identified.
	10/2013 (C1R14)	VT-1	No indications were identified.
Wedge Bearing Surface WD-1	2/2004 (C1R09)	VT-1	50 % were inspected. No indications were identified.
	2/2006 (C1R10)	VT-1	Four (4) were inspected. No indications were identified.
	01/2008 (C1R11)	VT-1	Six (6) were inspected. No indications were identified.
	01/2010 (C1R12)	VT-1	Thirteen (13) were inspected. No indications were identified.
Jet Pump Diffuser Welds AD-1, AD-2, DF-1 DF-2, and DF-3.	2/2004 (C1R09)	UT	UT was performed on all welds of 100% diffusers
Jet Pump Diffuser Welds	10/2013 (C1R14)	EVT-1	
AD-1			JP-1, JP-2, JP-3, JP-5. No indications identified.
AD-2			JP-1, JP-2, JP-3, JP-4, JP-5. No indications identified.
DF-1			JP-1, JP-5. No indications identified.
DF-2			JP-1, JP-2, JP-3, JP-4, JP-5. No indications identified.
DF-3			JP-1, JP-2, JP-3, JP-5. No indications identified.
Jet Pump Beams Baseline	01/2008 (C1R11)	UT	No indications identified.
Jet Pump Beams Re-Inspection	10/2013 (C1R14)	UT	No indications identified.
Jet Pump Fouling A, B, and C	01/2010 (C1R12)	VT-1	Four JP Fouling were inspected. No indications were identified.
Jet Pump Fouling A, B, and C	12/2011 (C1R13)	VT-1	Four JP Fouling were inspected. No indications were identified.
Jet Pump Fouling A, B, and C	10/2013 (C1R14)	VT-1	Four JP Fouling were inspected. No indications were identified.

CRD Guide Tube			
CRD Guide Tube	4/2002 (C1R08)	EVT-1/VT -3 (as applicable)	11% examined (17) per VIP-47, CRDGT-1,2,3 and pin. No indications were identified.
Dry Tubes			
4 IRM	4/2002 (C1R08)	VT-3	No indications were identified.
	2/2004 (C1R09)	VT-1	No indications were identified.
	2/2006 (C1R10)	VT-3	No indications were identified.
	1/2008 (C1R11)	VT-3	No indications were identified.
	1/2010 (C1R12)	VT-1	No indications were identified. Inspection performed per GESIL-409.
	12/2011 (C1R13)	VT-3	No indications were identified. Inspection performed per GESIL-409.
	10/2013 (C1R14)	EVT-1	Four (4) IRM's were inspected. One indication was found on IRM C and one indication was found on IRM E.
2 SRM	2/2004 (C1R09)	VT-1	Four (4) SRM's were inspected. One indication identified on SRM 'D'. Evaluated for operating one cycle.
	2/2006 (C1R10)	VT-3	One (1) SRM was inspected. No indications were identified.
	2/2006 (C1R10)	VT-3	SRM 'D' dry tube was replaced in C1R10.
	1/2008 (C1R11)	VT-3	Two (2) SRM's were inspected. One indication identified on SRM 'A'.
	1/2010 (C1R12)	VT-1	Two (2) SRM's were inspected. No indications were identified.
	12/2011 (C1R13)	VT-3	Two (2) SRM's were inspected. One indication identified on SRM 'B'.
	10/2013 (C1R14)	EVT-1	Two (2) SRM's were inspected. One indication was identified on SRM 'C'. One indication of plunger wear was identified on SRM 'D'. SRM B was replaced in C1R14.

4 LPRM	2/2006 (C1R10)	VT-3	No indications were identified.
	1/2008 (C1R11)	VT-3	No indications were identified.
	1/2010 (C1R12)	VT-1	No indications were identified.
	12/2011 (C1R13)	VT-3	No indications were identified.
	10/2013 (C1R14)	EVT-1	Four (4) LPRM's were inspected. Two LPRM's had indications identified (not IGSCC). The lower flow holes of two LPRM plungers were covered over from inside.
Instrument Penetrations			
Instrument Penetrations	N/A	N/A	N/A
Vessel Interior			
Interior	10/2000 (C1R07)	VT-3	Section XI inspection. No indications were identified.
	2/2004 (C1R09)	VT-3	Section XI inspection. No indications were identified.
	01/2008 (C1R11)	VT-3	Section XI inspection. No indications were identified.
	12/2011 (C1R13)	VT-3	Section XI inspection. No indications were identified.
Brackets			
Steam Dryer Hold Down Brackets	10/2000 (C1R07)	VT-3	Section XI inspection. No indications were identified.
	12/2011 (C1R13)	VT-3	Section XI inspection. No indications were identified.
Steam Dryer Support Brackets	10/2000 (C1R07)	VT-3	Section XI inspection. No indications were identified.
	2/2004 (C1R09)	EVT-1	Several brackets have contact marks and several brackets do not. Clinton will be monitoring this condition.
	2/2006 (C1R10)	EVT-1	No change in contact mark.
	1/2008 (C1R11)	EVT-1/ VT-1/-3	No change in contact mark.
	1/2010 (C1R12)	EVT-1	No change in contact mark.
	12/2011 (C1R13)	EVT-1 & VT-3	No change in contact mark.

Guide Rod Support Brackets	10/2000 (C1R07)	VT-3	Section XI inspection. No indications identified.
	2/2006 (C1R10)	VT-1	No indications identified. Guide rods and brackets were inspected to look for any damage caused by steam separator lower bracket.
	12/2011 (C1R13)	VT-1 & VT-3	BWRVIP-48A and Section XI inspection. No indications identified.
Surveillance Sample Brackets	2/2004 (C1R09)	VT-1	Section XI inspection is SAT. However, both lower tack welds on 2 of the brackets found to be cracked. Evaluated for continued operation. Clinton will inspect these brackets in next refueling outage.
	2/2006 (C1R10)	VT-1	Inspected brackets at 3 deg. and 177 deg. and previously identified cracks. No change was observed.
	1/2008 (C1R11)	VT-1	Inspected brackets at 3 deg. and 177 deg. and previously identified cracks. No change was observed. Also, inspected the third one located at 183 deg. both upper and lower. No indications identified.
	1/2010 (C1R12)	VT-1	Inspected brackets at 3 deg. and 177 deg. and previously identified cracks. No change was observed.
Core Spray Bracket Attachments	12/2011 (C1R13)	VT-3	Section XI inspection. No indications identified.
Jet Pump Bracket Attachments	10/2013 (C1R14)	EVT-1/VT-1	EVT-1 was done on JP-1, JP-2, JP-3, JP-4, JP-5, JP-6, JP-7, JP-8, JP-9, JP-10, no indications identified. VT-1 was for Section XI inspection, no indications identified.
Steam Separator (1/2)			
Steam Separator (1/2)	10/2000 (C1R07)	VT-3	One minor dent identified.
	2/2004 (C1R09)	VT-3	Inspected previously identified dent/deformation. No change identified.
Lower Bracket @ 0 deg	2/2006 (C1R10)	VT-3	Performed VT-3 of Steam Dryer Tie Rods. No indications identified.
Guide Rod Flange 0 deg	12/2011 (C1R13)	VT-3	Slight gouge was identified. No change from C1R10 identified.
Guide Rod Flange 180 deg			No indications identified.
Lifting Eye 80 deg			2 slivers on the Upper Ring were identified and wear noted on both upper and lower intersections of lug to ring
Lifting Eye 150 deg			Wear noted on upper ring to assembly to lug.
Lower Tie Straps (0-90 deg)			No indications identified.
Lower Tie Straps (90-180 deg)			No indications identified.

Gussets (0-90 deg)			No indications identified.
Gussets (90-180 deg)			No indications identified.
Tie Bars (0-90 deg)			No indications identified.
Tie Bars (90-180 deg)			No indications identified.
Tubes (0-90 deg)			No indications identified.
Tubes (90-180 deg)			No indications identified.
Standpipe (0-90 deg)			No indications identified.
Standpipe (90-180 deg)			No indications identified.
Standpipe Gussets (0-90 deg)			No indications identified.
Standpipe Gussets (90-180 deg)			No indications identified.
Standpipe Gussets (180-270 deg)			No indications identified.
Standpipe Gussets (270-360 deg)			No indications identified.
Upper Support Ring (0-90 deg)			No indications identified.
Upper Support Ring (90-180 deg)			No indications identified.
Lifting Eye 80 deg	10/2013 (C1R14)	VT-3	Wear at upper support ring interface, tack weld on the bottom of the rod was missing.
Lifting Eye 150 deg			Wear noted on rod to upper support ring interface.
Lifting Eye 260 deg			Indications noted on tack welds on the bottom of the rod. Wear noted on interface between rod and upper ring.
Lifting Eye 330 deg			Wear noted on lifting rod interface to upper support ring.
Lower Tie Straps (180-270 deg)			No indications identified.
Lower Tie Straps (270-360 deg)			No indications identified.
Gussets (180-270 deg)			No indications identified.
Gussets (270-360 deg)			No indications identified.
Tie Bars (180-270 deg)			No indications identified.
Tie Bars (270-360 deg)			No indications identified.
Tubes (180-270 deg)			No indications identified.
Tubes (270-360 deg)			No indications identified.
Standpipe (180-270 deg)			No indications identified.
Standpipe (270-360 deg)			Examined previous indication, no change was identified.
Standpipe Gussets (180-270 deg)			No indications identified.

Standpipe Gussets (270-360 deg)			No indications identified.
Upper Support Ring (180-270 deg)			No indications identified.
Upper Support Ring (270-360 deg)			No indications identified.
Steam Dryer			
Tie Bars	4/2002 (C1R08)	VT-3	Performed VT-3 of Steam Dryer Tie Bars. No indications identified.
Drain Channel #8 to the Skirt (V16)	4/2002 (C1R08)	VT-3	The existing crack on drain channel #8 to the skirt was measured 7 5/8". No change from the previous outages. This crack was identified in 1/1989 (C1R01). Clinton has been monitoring this crack since C1R01. C1R08 is the baseline for this crack since Clinton has been operating at higher power after C1R08.
	4/2004 (C1R09)	VT-3	The existing crack on drain channel #8 to the skirt was measured 8 3/4". It grew 11/8" in one cycle. In C1R08 (4/2002) it was measured 7 5/8". This crack was repaired in C1R09 (2/2004) using under water welding.
Drain Channel Welds	2/2006 (C1R10)	N/A	Drain Channel welds were re-inforced from 1/8" to 1/4"
All Banks, Coverplates, End Panels, Hoods, Drain Channels, Skirt, Top and Tie Bars etc. from outside.	2/2004 (C1R09)	Best Effort VT-1/VT-3	All welds were examined from outside. One minor dent was recorded. No other indications were identified.
	2/2006 (C1R10)	VT-1	All welds examined from outside. 1) An indication was observed in the drain channel base material, away from the weld. The indication appears to be a minor mechanical deformation. This indication was evaluated for continued operation. 2) Two (2) indications were observed in the dryer bank 5 horizontal weld H3. These indications are located under tie rods 28 and 30. They are 12.75" and 2.25" long. These indications were repaired by stop drill method. 3) A linear indication was observed in the dryer upper guide at 0 deg. This indication is 1.6" long. This indication was evaluated for continued operation. 4) Several linear indications were observed in the dryer upper support ring face. They are located at various locations and degrees. These were evaluated for continued operation.

	1/2008 (C1R11)	VT-1	1) Examination was performed from the outside of the dryer. A base metal crack was observed adjacent to drain channel 7, weld V-14. Another crack like indication was observed in the skirt adjacent to the V-6 weld, in the area of an access hole patch. Scope was expanded to perform examination from the inside of the dryer. 2) Examination was performed from the inside of the dryer using Firefly. The steam dryer inside area of the access hole patches were examined. The inspections observed several linear indications in the base material at all 6 access hole patches. Evaluated for continued operation. 3) The upper support ring was examined. Cracking was observed in the upper support ring at the location of 210 inside access hole patch. Evaluated for continued operation.
All Banks, Coverplates, End Panels, Hoods, Drain Channels, Skirt, Top and Tie Bars etc. from outside.	1/2010 (C1R12)	VT-1-89	1) Performed VT-1-89 of 32 Steam Dryer Tie Rods. Indication on Tie Rod 28 from C1R11, has no new growth or new indications. 2) Steam Dryer Lower Support Ring Contact area has an indication from a past outage, with no change in C1R12. 3) Drain Channels 3, 5, and 7 have indications from previous outages, but have no changes. Inspection was satisfactory. 4) The six Steam Dryer Access Holes from C1R11 were reinspected, there is no change. 5) Banks 1-5 were visually inspected. Bank 5 had an indication found in C1R10, there was no change to the indication.
Steam Dryer Lower Support Ring	12/2011 (C1R13)	VT-1-132	Steam Dryer Lower Support Ring Contact area has an indication from a past outage, with no change in C1R13.
LPCI Coupling			
Loops 'A' and 'B' Except weld 6-6b.	10/2000 (C1R07)	EVT-1	Performed EVT-1 of LPCI Couplings, both Loops 'A' and 'B'. No indications were identified.
Loop 'C' Except weld 6-6b.	4/2002 (C1R08)	EVT-1	Performed EVT-1 of LPCI Coupling 'C'. No indications were identified.
Weld 6-6b's (all 3 loops)	2/2004 (C1R09)	EVT-1	Performed EVT-1 on all 3 loops. No indications were identified.
Reinspection LPCI Coupling Loop 'A'	2/2006 (C1R10)	EVT-1	No indications were identified.
Reinspection LPCI Coupling Loop 'B'	1/2010 (C1R12)	EVT-1	No indications were identified.

Reinspection LPCI Coupling Loop 'C'	10/2013 (C1R14)	EVT-1	No indications were identified.
Feedwater Spargers			
FW Sparger End Brackets	4/2002 (C1R08)	EVT-1	Performed EVT-1 on Feedwater Sparger End Brackets. No indications were identified.
	1/2008 (C1R11)	VT-1	Performed VT-1 of End Bracket Bolt Stops only. Evidence of movement and wear were observed on four (4) out of eight (8) End Bracket Bolts. This condition was evaluated and accepted for continued operation.
	1/2010 (C1R12)	VT-3	Performed VT-3 of End Bracket Bolt Stops only. Four out of eight, had evidence of movement and wear from C1R11, there was no change in indication sizes.
	12/2011 (C1R13)	VT-1 & EVT-1	Performed VT-1 of End Bracket Bolt Stops only. Four out of eight, had evidence of movement and wear from C1R11, there was no change in indication sizes. Performed EVT-1 on Feedwater Sparger End Brackets. No indications were identified.
	10/2013 (C1R14)	VT-1	Performed VT-1 of Bolt, Nut and Tack Welds. Four out of eight, had evidence of movement and wear from C1R11, there was no change in indication sizes.
FW Sparger	4/2002 (C1R08)	VT-3	Performed visual inspection of feedwater spargers per NUREG-0619. No indications were identified.
	1/2010 (C1R12)	VT-3	Sparger was VT-3 inspected at 45, 135, 225, and 315 degrees. No indications were identified.
BWRVIP-75-A Cat "D" Dissimilar Welds			
Dissimilar Welds, Cat "D"	1/2006 (C1R10)	UT	Performed UT on 26 DM welds (23 of these contain Inconel 182 buttering). No indications identified.
Dissimilar Welds, Cat "D"	1/2008 (C1R11)	UT	Performed UT on 5 DM welds (all 5 welds contain Inconel buttering.) No indications identified.
Dissimilar Welds, Cat "D"	1/2010 (C1R12)	UT	No examinations required or performed.
Dissimilar Welds, Cat "D"	12/2011 (C1R13)	UT	Performed UT on 26 DM welds (23 of these contain Inconel 182 buttering). No indications identified.
Dissimilar Welds, Cat "D"	10/2013 (C1R14)	UT	Performed UT on 5 DM welds. No indications identified.

Reactor Internals Inspection History

Plant: **Dresden Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Spray Piping	1980s to D2R14	UT, VT-1 (1MIL)	IEB 80-13 (1 MIL) VT-1 of piping and welds in annulus. Indications observed at one lower elbow to riser weld (3P4c) and two collar to shroud pipe welds (3 and 4P8a) in 1995. All flaw lengths verified with UT. Full structural margins met on all three flawed welds for additional cycle. No repairs performed.
	3/1998 D2R15	UT, 0.0005" EVT	GE CSI-2000 Inspected with EVT-1 supplement for unqualified welds (P8a and P4d). Identified three previously unidentified flaws (1P5, 2P8a and 3P4d) for a total of six flaws. All flaws were analyzed for two additional cycles of operation with no repairs required. Previously identified flaws were determined to be of the same or less extent than originally sized. 1P5 and 2P8a were not visually verified.
	10/2000 D2R16	EVT-1	Core Spray Piping: P8a and P4d, EVT-1 @ all four locations. Previous indications have been found on the Core Spray Elbow to Collar on the 260° Downcomer. The results of the 1999 measurements compared with the two previous 1998 indications are as follows. It appears that the Collar indication has not changed, while the indication on the elbow is larger this year than was seen in 1998. The noted crack growth was bounded by the previous flaw evaluation and the BWRVIP-18 crack growth value.
	10/2001 D2R17	UT, EVT-1	GE CSI-2000 inspected a complete Target Set and a sample of P4 welds. No new flaws. Growth within Fracture Mechanics Evaluation predictions. Performed EVT-1 of undemonstrated welds.

	10/2003 D2R18	EVT-1, VT-1	Excessive grinding exam of 1-4P4a and b (VT-1). Undemonstrated 1-4P8a and P4d (EVT-1). Flaws are unchanged.
	11/2005 D2R19	UT, EVT-1	GE CSI-2000 inspected all demonstrated welds. Previous flaws re-sized, growth within flaw evaluation and BWRVIP-18 predictions. EVT-1 all undemonstrated welds. No new flaws identified. EVT-1 25% (2) piping bracket assembly welds. NRI.
	11/2007 D2R20	EVT-1	EVT-1of piping welds P1, P2, P3 P8a, P8b and 25% of P4a, P4b, P4c and P4d in accordance with BWRVIP-18. RIs for previous indications in 3P4d, 3P8a, 4P8a.
	11/2009 D2R21	EVT-1	EVT-1of all P1, P2, P3 and 25% of P4a & b piping welds in accordance with BWRVIP-18. NRI. Performed Core Spray Lower Sectional Replacement on all four lines. Welds P4c & d, P5, P6, P7, P8a & b and P9 all replaced. One P9 weld was examined after the old pipe was removed with no relevant indications. The other three P9 welds were destroyed by the EDM cut and could not be inspected.
	10/2011 D2R22	EVT-1	EVT-1of all P1, P2, P3 and 25% of P4a & b piping welds. NRI. EVT-1 on piping attachment welds on all four piping braces
		VT-1/VT-3	Core Spray Lower Sectional Replacement (all 4 lines) - VT-1 of bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/2013 D2R23	EVT-1	EVT-1of all P1, P2, P3 and 25% of P4a & b piping welds. NRI.
Core Spray Sparger	1980s to presen	VT-1 (1 MIL)	IEB 80-13 (1 MIL) VT-1 of spargers and tee-boxes. No indications found. Future inspections per BWRVIP-18.

	3/1998 D2R16	EVT-1, MVT-1	End caps, cover plates and tee box branch welds were EVT-1 examined (OD). All sparger connections and bracket welds were MVT-1 examined. NRI.
	10/2001 D2R17	EVT-1, VT-1	Complete Target Set and 50% of S3 welds. No Indications recorded.
	11/2005 D2R19	EVT-1, VT-1	EVT-1 100% S1; S2; S4. NRI. VT-1 50% S3. NRI. VT-1 100% (12) SB. NRI.
	11/2009 D2R21	EVT-1, VT-1	EVT-1 100% S4. NRI. VT-1 50% S3. NRI. VT-1 100% (12) SB. NRI. S1 and S2 structurally replaced by bracket as part of lower sectional replacement.
	11/2013 D2R23	EVT-1, VT-1	EVT-1 100% S4. NRI. VT-1 50% S3. NRI. VT-1 100% (12) SB. One RI identified in heat affected zone of the 260° bracket. Indication acceptable for one cycle.
Vessel ID Brackets	4/1994 D2R15	VT-1	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. No indications noted.
	3/1998 D2R16	MVT-1	Inspected Core Spray Brackets per BWRVIP recommendations. NRI.
	10/2000 D2R17	VT-1 VT-3 EVT-1	100% (6) Surveillance Capsule Brackets. NRI. 100% (6) Guide Rod Attachments. NRI. EVT-1 100% (4) Dryer Lugs. NRI.
	10/2003 D2R18	EVT-1, VT-1	EVT-1 100% (4) Dryer Lugs. NRI. Eight feedwater sparger end-brackets VT-1, NRI. Eight Core Spray piping bracket welds, EVT-1, NRI.
	11/2005 D2R19	EVT-1, VT-1	- EVT-1 100% (8) feedwater sparger end bracket to vessel attachments. NRI. - VT-1 100% (8) feedwater sparger end

			bracket lug. NRI. - EVT-1 100% (8) feedwater sparger end bracket pin tack weld. NRI. - VT-1 feedwater sparger repair at 240°. RI. Hole in the weld of the repaired nozzle. Accepted as-is. - EVT-1 25% (2) core spray piping bracket to vessel attachments. NRI. - EVT-1 100% (4) steam dryer wall support lugs. NRI.
	11/2007 D2R20	EVT-1 VT-3	- EVT-1 and VT-3 of 25% of Core Spray piping brackets (2). NRI - EVT-1 100% (8) feedwater sparger end bracket pin and nut. RI, some wear identified at pin head to bracket interface on three pins. One nut not tight against shoulder.
	11/2009 D2R21	EVT-1 VT-1	- EVT-1 of 25% of Core Spray piping brackets (2). NRI - VT-1 100% (8) feedwater sparger end bracket pin and nut. RI, some wear identified at pin head to bracket interface on six pins.
	10/2011 D2R22	EVT-1 VT-1 VT-3	- EVT-1 of 25% of Core Spray piping brackets (2). VT-1 on bolting of 1 of the 2 brackets. NRI - VT-3 of moisture separator and dryer guide rod attachments. RIs for top cone bent on 200° guide rod and gouge/metal shaving on top cone of 0° guide rod. NRI for attachment welds. - VT-1 100% (4) dryer wall support lugs. Gouges noted on 3 of the lugs. - VT-1 on all surveillance sample holder lower brackets and VT-3 on upper brackets. NRI.
	11/2013 D2R23	EVT-1 VT-1	- EVT-1 of 25% of Core Spray piping brackets (2). VT-1 on bolting for 1 of the 2 brackets. NRI - EVT-1 100% (8) feedwater sparger end bracket to vessel attach. NRI. - EVT-1 of 200° moisture separator and 0° dryer guide rod top cones. No change to previous RIs. - VT-1 100% (4) dryer wall support lugs. Gouges and wear marks noted on all of the lugs.

Feedwater Sparger	10/2011 D2R22	VT-1	Inspected all eight feedwater sparger end bracket pins and nuts. RI, some wear identified at pin head to bracket interface on six pins. Performed inspections of spargers, arm welds and t-box welds. RI - gouge on sparger. RI - sparger repair hardware previous indication, no change.
	11/2013 D2R23	VT-1	Inspected all eight feedwater sparger end bracket pins and nuts. RI, wear on six of eight brackets at pin to bracket interface.
Core Shroud	8/1995 D2R14	EVT-1, UT	Inspections per BWRVIP Guidelines of all shroud repair design reliant structures prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspection of shroud consisted of EVT-1 of all ring segment welds (accessible surfaces), EVT-1 of between 43% and 72% of the length of each vertical weld between H1 & H2 from OD surface (ID not accessible), UT of between 30% and 50% of the length of each of the 6 beltline vertical welds, EVT-1 of between 43% and 72% of the length of 2 of the 3 vertical welds between H6 & H7 from OD surface (ID not accessible), and UT of 35% of the length of the remaining vertical weld between H6 and H7. No Reportable Indications.
	03/1998 D2R15	VT-1, VT-3	Shroud repair hardware inspected per GE recommendations. NRI.
	10/1999 D2R16	UT & EC	UT & EC examinations from the ID with the TEIDE 2 manipulator on the core shroud vertical welds V14, V15, V16, V17, V18, and V19 per the requirements of BWRVIP-76 for a repaired shroud. NRI. Coverages are as follows: V14: 80.1% V15: 80.1% V16: 83.4% V17: 52.6% V18: 62.8% V19: 58.0%

	10/2001 D2R17	EVT-1	Exelon performed one sided EVT-1 of all vertical welds outside of the beltline with 100% coverage including welds V5, V6, V7, V26, V27 and V28. There were no recordable indications.
	11/2005 D2R19	EVT-1, VT-1	EVT-1 100% (16) Ring Segment Welds from the OD. NRI. Coverages were 100% except for the following: V9: 85% V11: 95% V20: 0% (inaccessible due to Jet Pump diffuser) V21: 90% V24: 0% (inaccessible due to Jet Pump diffuser) Attempted EVT-1 of shroud vertical welds V29, V30, V31, V32. 0% coverage was achieved due to Jet Pump interference. Performed 10 year shroud tie rod examination of all four tie rods: - EVT-1 of the clevis pin to verify if bottomed in slot and checking contact area for movement. NRI. - VT-1 of stabilizer assembly contact between the RPV wall and upper contact, mid support, and lower contact. RI @ 20 and 110 degrees. Accepted as-is. - VT-1 of retainer devices at lower support, lower spring to tie-rod connection, upper spring jacking bolts and tie rod nut. NRI. - VT-1 of contact of the stabilizer assembly between the shroud and upper and lower springs. NRI. - VT-1 of the core plate wedge contact. NRI.
	11/2007 D2R20	UT EVT-1	- Performed UT on the following vertical welds with the percent coverage shown: V14: 19.9% V15: 85.8% V16: 90.1% V17: 35.0% V18: 84.0% - RI, Accept as-is. V19: 47.2% V27: 63.9% Besides V18, all other welds NRI EVT-1 of welds V05-V07, V19, V26,

			V28, V29 and V31. NRI
		EVT-1 VT-3	- Shroud repair hardware inspections at all four locations. NRI.
	11/2009 D2R21	EVT-1	Two sided EVT-1 on V19. NRI
	10/2011 D2R22	EVT-1	One-sided EVT-1 on vertical ring welds V1, V2, V3, V4, V8, V9, V10, V11, V12, V13, V20, V21, V22, V23, V24 and V25. NRI.
	11/2013 D2R23	EVT-1	One-sided EVT-1 on vertical welds V5, V6, V7, V14, V17, V26, V28, V29, and V31. NRI.
Shroud Support	3/1993 D2R13	UT/VT-1	Access hole covers proactively replaced with GE mechanical design. UT for radial flaws performed prior to replacement. No indications identified.
	8/1995 D2R14	EVT-1, VT-1	EVT-1 of H8 and H9 for approx 12" at 4 locations of shroud repair hardware attachment areas. VT-1 of both replacement access hole cover assemblies. No indications identified.
	3/1998 D2R15	N/A	Not Inspected during D2R15
	10/1999 D2R16	EVT-1	Core Support Structures, Performed EVT-1 of H8 and H9 Welds per BWRVIP-38 requirements. No Recordable Indications Inspected both Shroud Access Hole Cover repairs, NRI.
	11/2005 D2R19	EVT-1, VT-3	EVT-1 H8 & H9 from 132-177°. NRI. VT-3 H9 100% accessible areas. NRI.
	10/2011 D2R22	EVT-1	EVT-1 top side of H8 & H9 welds at 132-177° and 312-357°. NRI.
		VT-1	Bolted attachment for both Access Hole Covers. NRI.
	11/2013 D2R23	UT	UT of 10% of the H9 weld. NRI

Top Guide	8/1995 D2R14	VT-1	VT-1 of 5 cells. NRI. VT-1 of all 4 alignment assemblies. NRI. VT-1 of rim to bottom plate weld at 4 locations. NRI.
	3/1998 D2R15	N/A	No inspections during D2R15.
	10/2000 D2R16	EVT-1	Top Guide Alignment Pins, EVT 90° and 270° and Rim to Lower Plate Weld per BWRVIP-26. No Reportable Indications
	10/2003 D2R18	EVT-1 VT-1	Top Guide aligner assemblies at 0, 180° and 270° welds (EVT-1) and pin (VT-1), NRI
	11/2005 D2R19	EVT-1	Top guide rim weld at 235° on the outboard side of cell 03-30. NRI.
	11/2007 D2R20	EVT-1 VT-1	Top guide rim welds, aligner pins and sockets at 0° and 90°.
	10/2011 D2R22	EVT-1	Top guide rim weld was inspected at accessible locations. One RI - a 12" linear indication was identified.
		VT-1	The aligner pins and sockets at 180° and 270°. NRI.
		EVT-1	Top guide grid beams were inspected from 10% of the cells (18 cells). NRI.
	11/2013 D2R23	EVT-1	Top guide rim weld indication inspected with no change noted from previous outage.
SLC	11/2005 D2R19	Enhanced VT-2	Safe end and nozzle examined. NRI.
	11/2007 D2R20	Enhanced VT-2	Safe end and nozzle examined. NRI.
	11/2009 D2R21	Liquid Penetrant	Safe end and nozzle examined. NRI.
	11/2013 D2R23	UT	Safe end and nozzle examined. NRI.
Jet Pump Assembly	8/1995 D2R14	VT-1 UT	Hold down beams, beam bolt keepers, lock-plates and retainers; restrainer wedges, stops, and adjusting screws,

			clamp bolts and keepers; riser brace assemblies, adapters and baffle plate welds, sensing lines and sensing line brackets per various SILS. Latest inspections were in 1995, with no reportable indications. Inspect 100% every other (even numbered) outage. Jet pump beams are UT examined each outage using technique capable of detecting cracking at throat and ears. One beam found cracked at ear in 1995 and was replaced.
	3/1998 D2R15	UT, EVT-1	D2R15 Beam UTs, NRI. Jet Pump Riser Welds RS-1, 2, 3, 4 and 5 OD Inspected on all ten risers. Riser to JP Pair 15/16 has 1-1/2" long crack in elbow HAZ at RS-1. Evaluated for two cycles of operation without repair. NRI all others.
	01/2000 D2R16	UT, EVT-1	Jet Pump Beams, UT 100% of Beams NRI Riser Brace, Restrainer Bracket, Wedges and Inlet Mixers EVT-1 High/Medium Priority Welds Per BWRVIP-41 sample and inspection requirements. Minor Indications noted.
	10/2001 D2R17	UT, EVT-1	Jet Pump Beams, UT 100%, NRI Riser Brace Leaf at RPV wall block on JP#9, upper Rb 4 weld cracked. EVT-1 examined 100% scope expansion, no other indications. Checked and found no set screw gaps. Examined for B-N-2. Measured known RS-1 crack on riser 15/16. No change in last two cycles.
	10/2003 D2R18	EVT-1	Replaced all 20 Jet Pump Beams with BWR4 weldless keeper beams Installed 19 Riser Brace Mitigation clamps one Repair on JP#9. Measured flaw on JP#15/16 RS-1. Increased from 1 1/2" to 2" length. Identified pup piece present on JP#5/6,
	11/2005 D2R19	EVT-1 VT-1 VT-3	VT-1 100% (20) WD-1. NRI. VT-3 100% (20) Jet Pump Bream Tooth Engagement. NRI. VT-1 100% (8) Jet Pump Sensing Line Clamps. RI (2). Teeth not fully

			engaged. Accepted as-is. EVT-1 30% (3) RS-4, 5. NRI. EVT-1 50% (5) RS-1, 2, 3. RI on JP 15/16 RS-1. Size confirmed to be 1½ ". VT-1 100% (20) Jet Pump Riser Brace Clamps. RI (8). Teeth on keepers not fully engaged. Accepted as-is. EVT-1 AS-1, 2 on Jet Pumps 8, 9, 19 (AS-1 only). NRI VT-1 Aux. wedge on VS of Jet Pump 11. NRI.
	11/2007 D2R20	VT-1 EVT-1 VT-3	- VT-1 100% (8) Jet Pump Sensing Line Clamps. RI (7). Teeth not fully engaged. Accepted as-is. - EVT-1 of six RB-3 welds. NRI - EVT-1 of RS-1 weld on JP 15/16. RI on previously identified indication. No change in flaw size. - Swing gate replaced and 2 aux wedges installed on Jet Pump 19. - VT-3 of IN-5 bolting sets on 10 JPs. NRI - EVT-1 of MX-1 welds on 10 JPs. NRI - VT-1 of 5 JP wedges and swing gate keeper tack welds. One RI on JP 15 swing gate keeper degraded tack weld. Accepted as-is for one cycle. - VT-1 of ratchets on eight JP Riser Brace clamps and eight JP Sensing Line clamps. Multiple RIs for incomplete ratchet teeth engagement. Accepted as-is.
	11/2009 D2R21	EVT-1 VT-1	- EVT-1 25% (5) RB-4 & 5. NRI - EVT-1 30% (3 risers) RS-8 & 9. NRI - EVT-1 JP 15/16 RS-1. Previous indication - No change - EVT-1 25% (5) MX-3a and 40% (8) MX-3b. NRI - VT-1 25% (5) WD-1. NRI - VT-1 three aux wedges. Minor wear identified on one wedge. Accepted-as-is for one cycle. - VT-1 on five swing gate keepers/ratchets. One RI for crack in tack weld HAZ and Two RIs for small gap between gate and restrainer bracket. - VT-1 two sensing line clamps and one sensing line. No change to previous indications.

			- Replaced JP 15 swing gate.
	10/2011 D2R22	EVT-1 VT-1	- EVT-1 30% (6) RB-3. NRI - EVT-1 70% (7 risers) RS-8 & 9. NRI - EVT-1 60% (6 risers) RS-1 & JP 5/6 RS-1a. JP 15/16 RS-1 previous indication - No change - EVT-1 50% (5 risers) RS-2 & 3. NRI - EVT-1 30% (3 risers) RS-4 & 5. NRI - VT-1 75% (15) WD-1. NRI - VT-1 on JP 19 aux wedges. NRI - VT-1 on seven swing gate keeper tack welds or ratchets. One RI for crack in tack weld HAZ (no change from D2R21). - VT-1 two sensing line clamps. RI for ratchet teeth engagement and clamp movement.
	11/2013 D2R23	EVT-1 VT-1 VT-3	- VT-1 on 5 riser brace mitigation clamps and the jet pump 9 riser brace repair clamp. NRI - EVT-1 of jet pump 15/16 riser RS-1. No change to previous RI but better video has concluded the flaw is only 0.875″ (previously recorded as 1.5″) - VT-1 on jet pump 2 and 11 sensing line clamps. No change to previous RIs. - VT-1 25% (5) WD-1. NRI - VT-1 30% of swing gate keeper tack welds. No change to previous RI on JP 2. - VT-1 on JP 11 and 19 aux wedges. No change to previous RI. - VT-1 of all 20 beam retainer clips. NRI - EVT-1 25% (5 jet pumps) MX-1. NRI - VT-3 25% (5 jet pumps) IN-5. NRI
Jet Pump Diffuser	8/1995 D2R14	VT-1	Diffuser to baffle plate welds on all 20 jet pumps. No indications.
	3/1998 D2R15	N/A	Not inspected D2R15.
	01/2000 D2R16	EVT-1	JP Diffuser EVT-1 High/Med Priority welds per BWRVIP-41 sample and inspection requirements. NRI
	10/2001 D2R17	EVT-1	No scope D2R17.

	10/2003 D2R18	UT, EVT-1	UT examined Jet Pumps# 2, 3, 4, 5, 8, 9, 12, 13, 14, 15, 18 and 19. This completes first 6 Year Inspection Interval. NRI EVT-1 of the last of the Medium Priority 50% sample also completed. NRI.
	11/2005 D2R19	N/A	Not inspected in D2R19.
	11/2007 D2R20	N/A	Not inspected in D2R19.
	11/2009 D2R21	EVT-1	- 25% (5) DF-1 and 50% (10) DF-2. NRI - 50% (10) AD-1, AD-2 and AD-3a. NRI
	11/2013 D2R23	VT-3	VT-3 inspection of 1 jet pump slip joint. NRI
CRD Guide Tubes	8/1995 D2R14	VT-1 (1 MIL)	11 CRD guide tube lower assembly welds, 2 CRD guide tube upper assembly welds, 4 CRD guide tube alignment ear welds. NRI.
	3/1998 D2R15	N/A	Not inspected D2R15.
	01/2000 D2R16	N/A	Not inspected D2R16
	10/2001 D2R17	EVT-1, VT-3	5% inspected (9) per BWRVIP-47, CRGT-1, 2, 3 and pin. NRI.
	11/2005 D2R19	N/A	Not inspected in D2R19.
	11/2007 D2R20	EVT-1, VT-3	Inspected 5% (9) of the control Rod Guide Tube Welds and Guide Tube and Fuel Support Alignment Pins. VT-3 on the CRGT-1 and AS-GT-ARPIN-1. EVT-1 of the CRGT-2 and 3. NRI
CRD Stub Tubes	8/1995 D2R14	VT-1 (1 MIL)	14 CRD housing to CRD stub tube welds, 14 CRD stub tube to RPV bottom head welds, 3 CRD housing tube to housing cap welds. NRI.
	3/1998 D2R15		Not inspected D2R15
	10/2000 D2R16		Not inspected D2R16

	10/2001 D2R17		Stub Tubes not inspected D2R17
	10/2003 D2R18		Stub Tubes not inspected D2R18
	11/2005 D2R19		Not inspected in D2R19.
In-Core Housing	8/1995 D2R14	VT-1 (1 MIL)	4 incore guide tube to housing welds, 4 incore housing to RPV bottom head welds, 4 incore guide tube stabilizers. NRI.
	3/1998 D2R15		Not inspected D2R15
	11/2005 D2R19	N/A	Not inspected in D2R19.
Dry Tubes	8/1995 D2R14	VT-1	No indications identified. Examined every other outage.
	3/1998 D2R15		Not examined D2R15.
	10/2000 D2R16	VT-1	NRI.
	11/2007 D2R20	VT-1	50% of SRM and IRM dry tubes inspected. NRI
	11/2009 D2R21	VT-1	50% of SRM and IRM dry tubes inspected. NRI
	10/2011 D2R22	VT-1	50% of SRM and IRM dry tubes inspected. NRI
	11/2013 D2R23	VT-1	One LPRM and 50% of SRM and IRM dry tubes inspected. NRI
Instrument Penetrations	N/A		
LPCI Coupling	N/A		

Steam Separator/ Shroud Head	11/2007 D2R20	VT-1	Inspected 100% of Shroud Head Bolt Alignment Pins and Windows. RI for one missing pin and pin/window wear on multiple shroud head bolts
	11/2009 D2R21	VT-1 EVT-1	- VT-1 Inspected 100% of Shroud Head Bolt Alignment Pins and Windows. RI for pin/window wear on multiple shroud head bolts - EVT-1 on Steam Separator Guide Rod top cone. RI for cracked tack weld. Acceptable-as-is.
	10/2011 D2R22	VT-1	- VT-1 Inspected 100% of Shroud Head Bolt Alignment Pins and Windows. RI for pin/window wear on multiple shroud head bolts
	11/2013 D2R23	VT-1	- VT-1 Inspected 100% of Shroud Head Bolt Alignment Pins and Windows. RI for pin/window wear on multiple shroud head bolts
Steam Dryer	11/2005 D2R19	VT-1 "best effort"	Performed BWRVIP-139 required inspections as well as inspections of high-stress areas as determined by GE models. Internal start-up instrumentation piping was also examined. Several RI, including: - Four of six gusset feet tip (adjacent to R2 weld), ranging from 7 to 11.5". Cracking was ground out and rewelded. Gusset feet extensions were designed and installed to transfer the stress riser to the mid-support ring. - Several internal strut/supports were identified with cracking. Several were historical from D2R18 inspections. No change in the cracking was observed. These welds are non-structural. Accepted as-is. - Vertical guide cracking (2) at 220°. Both cracks (2.5-5" in length) were stop-drilled. - Lower instrument line in Bank C observed cracking at the weld. Performed fracture mechanics analysis and lost parts analysis. Acceptable as-is. - Interior drain channel cracking (3). Performed GE analysis. Acceptable as-

			is. - Perforated plate weld cracking. Performed GE analysis. Acceptable as-is. - Perforated plate bowing. Performed GE analysis. Acceptable as-is.
	11/2007 D2R20	N/A	Replaced steam dryer with a new one.
	11/2009 D2R21	"Best Effort" VT-1	Examined critical components on steam dryer ID and OD after one cycle of operation per GE recommendations. NRI
	10/2011 D2R22	"Best Effort" VT-1	Examined OEM recommended components on OD. Lifting lug at 40° found rotated. Gouge identified on dryer skirt.
	11/2013 D2R23	"Best Effort" VT-1	Examined OEM recommended components on ID and OD. New RIs noted near the trough supports to cross beam welds at 8 locations. No change to previous RI identified on dryer skirt.
DM Welds	11/2009 D2R21		No inspections in D2R21
	10/2011 D2R22	UT	Inspected six DM welds. NRI
	11/2013 D2R23	UT	Inspected four DM welds. NRI
Reactor Vessel	10/2011 D2R22	UT	Inspected vertical welds (18) and the shell to flange weld. One indication identified in shell to flange weld identified as unacceptable per Table IWB-3510-1. Indication has been evaluated in accordance with IWB-3600.
	11/2013 D2R23	EVT-1	- Examined weld and heat affected zones on four level instrument nozzles. NRI

Cast Austenitic Stainless Steel	10/2011 D2R22	EVT-1	Inspected one of each of the following for License Renewal commitment: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/2013 D2R23	EVT-1	Inspected one of each of the following for License Renewal commitment: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI

Reactor Internals Inspection History

Plant: **Hope Creek**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	Winter 1996 RF06	VT-1 1 mil	Examined H-4, H-5 at 4 cell locations. No indications found IAW SIL 572 R1
	Fall 1997 RF07	UT	Examined 100% accessible regions of H-3,4,5,7. No indications found
	Fall 2007 RF14	UT	Examined 100% accessible regions of H-3,4,5,7. Achieved 60.1 to 62.8% coverage. Found 5 indications in H4, all less than 2 inches length, less than 15% thru wall, 2.1% of examined length. Found 1 indication in upper side H5, 4.3 inches in length, depth11%, 1.1% of examined length. Use as is for 10 years IAW VIP-76.
Shroud Support	Spring 1994 RF06	VT-3	Examined 6 shroud support pillar IAW Sec. XI. No indications found
	Fall 1997 RF07	VT3	Examined accessible portions of H-8 and H-9. No indications
		EVT-1	Examined access hole covers. No indications.
	Spring 2003 RF11	UT	UT of H-8, 11%, and H-9, 16%, from vessel OD.. No indications
		EVT-1	Examined access hole covers. No indications.
	Spring 2006 RF13	EVT-1	Examined access hole covers. No indications.
	Spring 2009 RF15	EVT-1	Examined access hole covers. No indications.
	Fall 2010 R16	VT-3	Examined annulus surface. No issues or FME found.
	Spring 2012 R17	EVT-1	Examined H-8 (18.6%) and H-9 (21%) top side only. Found 7 transverse flaws on H-9. Evaluated use as is for 6 years. Examined RPV OD at the flaw locations.

			No flaws penetrated into RPV low alloy steel.
	Fall 2013 RF18	EVT-1 EVT-1	Examined annulus surface, FOSAR, recovered 5 Powerfect nuts. Examined 3 flaws found in RF17 for growth. No growth. Examined Top Hat access hole cover. Examined 76.4% circumferentially of vertical weld, 38.5% has signs of indications.
Core Spray Piping	Winter 1996 RF06	VT-1	Piping and welds in annulus examined IAW IEB 80-13. One indication found on a bracket bolt tack weld.
	Fall 1997 RF07	EVT-1 VT-1	Examined all creviced and non-creviced weld locations, no indications Examined all (8) header brackets, no new indications.
	Spring 1999 RF08	EVT-1 VT-1 & 3	Examined all creviced and 25% non-creviced locations, no indications. Examined 25% header brackets, no new indications.
	Spring 2000 RF09	EVT-1 VT-1 & 3	Examined all creviced weld locations, no indications. Examined 25% header brackets, no indications.
	Fall 2001 RF10	EVT-1 VT-1 & 3	Examined all creviced and 25% non-creviced locations, no indications. Examined 25% header brackets, no indications.
	Spring 2003 RF11	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications. Examined 25% header brackets, no indications.
	Fall 2004 RF12	EVT-1 EVT-1 & VT-3	Examined all creviced and 25% non-creviced locations, no indications. Examined 25% header brackets, no new indications.

	Spring 2006 RF13	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
	Fall 2007 RF14	UT & EVT-1 EVT-1 & VT-3	Examined all creviced and 100% non-creviced locations, no indications. Examined 25% header brackets, no new indications.
	Spring 2009 RF15	EVT-1 EVT-1 & VT-3	Examined all locations that could not be UT examined in the previous outage, no indications. Examined 25% header brackets. No indications.
	Fall 2010 R16	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
	Spring 2012 R17	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
	Fall 2013 RF18	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
Core Spray Sparger	Winter 1996 RF06	VT-1	Piping and spargers in shroud examined IAW IEB 80-13. No indications.
	Spring 1999 RF08	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
	Fall 2001 RF10	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
	Fall 2004 RF12	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
	Fall 2007 RF14	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.

	Fall 2010 R16	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
	Fall 2013 RF18	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
Top Guide (Rim, etc.)	Fall 1992/ Spring 1994/ Winter 1996	VT-1	Examined IAW SIL 554. Examined 4 cell locations made available during normal refuel. No indications.
	Winter 1996 RF06	VT-3	Examined Top Guide wedges IAW SIL 588 R1. No indications.
	Fall 1997 RF07	VT-1	Examined IAW SIL 554. Examined 4 cell locations made available during normal refuel. No indications.
	Spring 1999 RF08	VT-3	Examined 4 C-clamps, no indications.
	Spring 2009 RF15	EVT-1 VT-3	Examined 4 top guide grid beam locations. No indications. Examined 4 C-clamps, no indications
	Fall 2010 R16	EVT-1	Examined 4 top guide grid beam locations. No indications.
	Spring 2012 R17	EVT-1	Examined 2 top guide grid beam locations. No indications
Core Plate (Rim, etc.)	Fall 1997 RF07	VT-3	Examined all hold down bolts, no indications.
	Spring 1999 RF08	VT-3	Examined 26 hold down bolts, no indications.
Jet Pump Assembly	Spring 1994 RF05	VT-1 VT-3	50% riser braces, RB-1/2 & RS-8/9, no indications 100% wedges and setscrews IAW SIL 574. 3 screws with 1 tack cracked
	Winter 1996 RF06	VT-1 VT-3	50% riser braces, RB-1/2 & RS-8/9, no indications 100% wedges and setscrews. 4 screws with 1 tack cracked, 2 screws with 2 tacks cracked

	Fall 1997 RF07	VT-1 VT-1 VT-3 VT-3	50% riser braces (RB-1/2 & RS-8/9), 100% RS-1, no indications 100% sensing lines. Three pumps have cracked standoffs, installed clamps. 100% beams, no indications 100% wedges and setscrews. 1 screw with 1 tack cracked
	Spring 1999 RF08	EVT-1 EVT-1 VT-1 VT-3	50% riser brace(RB-1/2 & RS-8/9), no indications 100% RS-1, no indications 100% sensing lines, no indications 100% beams, 100% wedges and setscrews, no indications
	Spring 2000 RF09	EVT-1 VT-1 VT-3	50% riser brace (RB-1/2 & RS-8/9), no indications 100% sensing lines, no indications 100% wedges and setscrews, no indications
	Fall 2001 RF10	VT-1 VT-3	100% sensing lines, no indications 100% wedges
	Spring 2003 RF11	VT-1 EVT-1 VT-1	100% wedges, no movement noted 100% RS-3, 50% RS-2, 50% RS6/7 50% IN-4, 50% MX-2, 50% DF-1/2, 50% AD1/2, 50%, no indications 50% sensing lines, no indications
	Fall 2004 RF12	UT VT-1 EVT-1	100% beams, BB1/2, no indications 50% sensing lines, no indications 25% RS-1, 50% RS-2, 50% IN-4, 50% MX-2, 50% DF-1/2, 50% AD1/2, 50% RS-6/7, no indications
	Spring 2006 RF13	VT-1 VT-1 EVT-1	50% sensing lines, no indications 100% wedges, one had minor wedge wear, installed slip joint clamp 25% RB-1/2, 25% RS-8/9, no indications
	Fall 2007 RF14	VT-1 VT-1 VT-1	100% wedges, one had minor wedge wear and SS setscrew gap of 35 mil, installed auxiliary wedge 1 slip joint clamp, no issues 7 setscrew tack welds previously identified with cracks. One setscrew found with all tacks cracked. Staked setscrew, use as is one cycle without

			auxiliary wedge.
		UT	100% beams, BB1/2, no indications
	Spring 2009 RF15	VT-1	100% wedges, no wear found.
		VT-3	Slip joint clamp and aux wedge. No issue found.
		VT-1	11 sensing lines. No indications.
		VT-3	Installed aux wedge for an issue found previous outage.
		EVT-1	50% RS3, no indications.
	Fall 2010 R16	EVT-1	100% RS-8/9 and 25% RS-6/7. No indications
		VT-1	50% wedges. No new wear found.
		VT-3	3 sensing line clamps and 1 aux wedge. No issue found.
	Spring 2012 R17	EVT-1	25% inlet/mixer and diffuser welds (IN4, MX2, DF1/2, AD1/2). No issue found.
		EVT-1& VT-1	3 riser brace welds. No issues found.
		VT-1	50% wedges. No new wear found.
		EVT-1	3 RS-1 and RS-2. No issues found.
	Fall 2013 RF18	UT	100% beams, no indications
		VT-1	3 sensing line lower bracket, no indications
		VT-1	6 known setscrews tack cracks. 3 confirmed no growth, 3 no indication.
CRD Guide Tube	Winter 1996 RF06	VT-3	Examined 6 guide tubes IAW Sec. XI. No indications
	Spring 1999 RF08	VT-3/1	Examined 4 guide tubes, no indications
	Spring 2003 RF11	VT-3/1	Examined 6 guide tubes no indications
	Fall 2004 RF12	VT-3/1	Examined 10 guide tubes, no indications
	Fall 2007 RF14	VT-1	Examined 5 guide tubes, no indications
	Fall 2013 RF18	EVT-1	Below Core Plate Inspection Examined 100% of CRGT-2 & CRGT-3
		VT-3	on CRGT 30-31. Examined Surrounding CRGT's

CRD Stub Tube	Spring 94 RF05	VT-3	Examined IAW Sec XI. Examined CRD Housing through removed jet pump diffuser. No indications.
In-Core Housing	Not examined		
Dry Tube	Fall 1992 RF04 Spring 1999 RF08 Spring 2000 RF09	VT-1 EVT-1	Examined IAW SIL 409. No indications found. All 12 dry tubes had circumferential cracking approx 1 inch below the upper collar Replaced all 12 dry tubes
Instrument Penetrations	Fall 1997 RF07	VT-1 and VT-3	Examine IAW Sec. XI, no indications
Vessel ID Brackets	Winter 1996 RF06 Fall 1997 RF07 Spring 1999 RF08 Spring 2000 RF09 Fall 2001 RF10 Spring 2003 RF11 Fall 2004 RF12	VT-1 VT-1 VT-3 VT-1 EVT-1 VT-3 VT-1 EVT-1 VT-1 VT-3 EVT-1 EVT-1	50% jet pump riser bracket, no indications 100% core spray header bracket, 50% jet pump riser bracket, 100% surveillance sample bracket, no indications. 100% guide rod bracket, 100% feedwater bracket, 100% steam dryer holddown bracket, no indications 25% core spray header bracket, 100% feedwater sparger bracket, 100% steam dryer support bracket, no indications. 50% jet pump riser bracket, no indications 100% guide rod bracket, no indications 25% core spray header bracket, no indications 50% jet pump riser bracket, no indications 25% core spray header bracket, no indications 100% guide rods, no indications 25% core spray header bracket, no indications 25% core spray header bracket, 100% steam dryer support bracket, 100% feedwater sparger bracket, no indications found.

		VT-3	100% guide rod bracket, no indications found.
	Spring 2006 RF13	EVT-1	25% core spray header bracket, 25% jet pump riser bracket, no indications
		VT-1	100% surveillance sample bracket, no indications
		VT-3	100% steam dryer holddown bracket, no indications
	Fall 2007 RF14	EVT-1	25% core spray header brackets
	Spring 2009 RF15	EVT-1	25% core spray header brackets.
		EVT-1 & VT-1	100% feedwater brackets. Found minor pin wear on 2 pins. Evaluation justified operation for one cycle.
	Fall 2010 R16	EVT-1	25% core spray header brackets.
		VT-1	2 Feedwater bracket pins where wear previously found. No discernable change.
	Spring 2012 R17	EVT-1	25% core spray header brackets and 3 jet pump riser braces. No issues found.
		VT-1	2 Feedwater bracket pins where wear previously found. Minor additional wear found.
	Fall 2013 RF18	EVT-1	25% core spray header brackets and 4 jet pump riser braces. No issues found.
		VT-1	
		VT-3	Examined 120deg surveillance capsule assembly.
LPCI Coupling	Fall 2001 RF10	EVT-1	Examined 50% couplings, no indications
		VT-1	
		VT-3	
	Spring 2003 RF11	EVT-1	Examined 50% couplings, no indications
		VT-1	
		VT-3	
	Spring 2006 RF13	EVT-1	Examined 50% couplings, no indications
		VT-1	
		VT-3	
	Spring 2012 R17	EVT-1	Examined 50% couplings, no indications
		VT-1	
		VT-3	

Steam Dryer	Fall 1997 RF07	VT-1	100% support ring, one indication identified on face, 2.25"
	Spring 1999 RF08	VT-1 VT-1	100% drain channels, no indications Re-look at previous support ring indication, no growth
	Spring 2000 RF09	VT-1	100% support ring, no new indications, no growth on previous indication
	Fall 2001 RF10	VT-1 VT-1	100% drain channels, one indication identified on skirt below a seismic lug access plate weld, 0.75" 100% support ring, no new indications, no growth on previous indication
	Spring 2003 RF11	VT-1 EVT-1 EVT-1 VT-1 VT-3 VT-1	100% support ring, no new indications, no growth on previous indication Re-look at skirt indication, no growth Manway coverplate 100% coverplates 100% tie bars 100% lifting lug braces, one found severed.
	Fall 2004 RF12	VT-1 VT-1	100% support ring, no growth on previous indication, new indication identified; 0.625" across top, and 0.75" down face. Outlet plenum plate welds-between banks B&C and D&E, outer hood welds at hood stiffener, outer hood welds at top, 100% drain channels, inner hood welds at hood stiffener, no indications.
	Spring 2006 RF13	VT-1 VT-1	Previously identified indications on support ring, no growth found. 100% hood assembly welds (exterior surfaces only), 100% tie bars, 100% lifting assembly welds, 100% cover plate welds. 4 locations had IGSCC type indications. Two indications were above a construction (original) repair patch on hood C with a combined length of 4". Another was on the outlet plenum plate between banks A&B near bottom, 1.25". Adjacent to the cover plate on the support ring a 5" indication was identified. On a lifting rod two indications were found on the threads near a tack weld. No repairs

			were made.
	Fall 2007 RF14	VT-1	5 locations with previously found indications. No crack growth found.
	Spring 2009 RF15	VT-1	Re-baseline IAW BWRVIP-139 and all previous indications inspected following EPU implementation. One new IGSCC flaw found on the support ring. Previous flaws on a lifting lug tack weld were found joined. One creator crack found on a lifting rod bracket weld. All indications were evaluated for use as is. No repairs required.
	Fall 2010 R16	VT-1	2nd re-baseline IAW BWRVIP-139 following EPI implementation. One new ISGCC flaw found on lifting rod threads near the tack weld. Indication was evaluated for use-as-is. No repair was made.
	Spring 2012 R17	VT-1	Re-examined IGSCC flaw and redundant tack weld on a lifting rod. No discernible change on previous flaw. New indication on redundant weld and evaluated for use-as-is. No repair was made.
	Fall 2013 RF18	VT-1	Examined 6 known flaws for growth. No growth observed.
RPV DM nozzle welds	Fall 2007 RF14	UT	Examined N2A, category C, automated UT. Found an 89.8% thru wall circumferential flaw and performed a weld-overlay repair. Expanded scope to examine N9, category C, manual UT and N2D, category C, automated UT. No indications found. Weld crowns ground flush for all three examinations. All three nozzles contain Alloy 82/182 weld material.
	Spring 2009 RF15	UT	Examined 8 category C welds with automated UT after weld crown reduction. Found embedded flaws on 3 welds, not ID surface connected. Evaluated IAW ASME section XI. No repair required.

	Fall 2010 R16 Spring 2012 R17 Fall 2013 R18	UT UT UT	Examined 5 category C welds after weld crown reduction; 2 by auto, 3 by manual. No indications found. Examined 1 category E weld by manual UT. Examined 3 category C welds with automated UT. No growth of known embedded flaws, no new indications.
Steam Separator	Fall 2013 RF18	UT UT	Examined all installed shroud head bolts (32 bolts). No indications. Examined 13 spares in fuel pool. No indications. (3 additional bolts in fuel pool were not inspected)
Below Core Plate	Fall 2013 RF18	EVT-1 VT-3	Removed guide tube, 30-31. Examined 100% of CRGT-2 & CRGT-3 on CRGT 30-31. Examined the In-Core Housing penetration tubes, welds and all accessible In-core housing support hardware. CRD Housing to Stub Tube weld and Instrumentation to RPV pen. at locations 30-31, 26-27, 30-27, 34-27, 34-31, 34-35, 30-35, 26-35, 26-31. Stub tubes (STRPV) and welds. Control Rod Drive Housing (CRDH-2, -3 & CRDH-ST), FME Exam. 1 Powerfect nut found next to location 26-31. Examined the underside of the Core Plate.

Reactor Internals Inspection History

Plant: **Peach Bottom Atomic Power Station, Unit 3**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1993	VT-1	Enhanced VT-1 (1 mil resolution) (100% ID of H-3, H4, & V-3) portions OD of H-1, H-2, H-3, H-4, H-5, H-6, and H-7 Prior to BWRVIP-01, Circumferential Indications on ID of H-3 and H-4 (Plate side, not ring side) Short circumferential indications on ID of V-3 weld. Evaluation of indications showed full structural margins for one operating cycle.
	1995	UT	Comprehensive UT Baseline of all Category "C" circumferential welds (H-1 through H-7). Baseline per BWRVIP-01, Rev. 1. Exams per BWR-VIP Core Shroud NDE Uncertainty and Procedure Standard, dated November 21, 1994. Indications identified on ID of H-1, H-3, H-4, and H-5. Full structural margins calculated using two cycles of crack growth. No indications identified on H-2, H-6, and H-7.
	1999	UT	UT Examination on welds H-3 & H-4. Re-identified indications on both welds. Extent of indications within existing structural analysis.
	2005	UT	Two-sided UT of all 7 horizontal welds (H1 thru H7) and 4 vertical welds (V3 thru V6). No indications at H2, H7, V4-V6 or ring side of any weld. One minor indication near V3. Indications at H1, H3, H4, and H5 correlated with those previously identified. One indication at H6 (new). One deep indication at H4. Characterized as thru-wall. Review of previous data (1995 and 1999) also characterized indication as thru-wall at that time. EVT-1 on OD surface did not identify any indications.

Shroud Support	1993	VT-1	Enhanced VT-1 (1 mil resolution), of portions of H-8 weld, No indications identified. VT-1 examination around perimeter of both access hole covers, No indications identified.
	1997	VT-1	VT-1 of both access hole cover bolted repairs. No indications identified.
	1999	EVT-1	10 % of weld length of welds H-8 & H-9 examined. No indications identified.
	2001	UT	10% of H-9 weld length from vessel O.D. No indications identified.
		VT-1	VT-1 of both access hole cover bolted repairs. No indications identified.
	2005	EVT-1	> 10% of H-8 weld, between jet pump banks, in area of AHCs.
		VT-1	VT-1 of both access hole cover bolted repairs. No indications identified.
		UT	Accessible length of H-9 between 0 and 180 degrees. No indications identified.
	2009	VT-1	VT-1 of both access hole cover bolted repairs. No indications identified.
	2011	EVT-1	> 10% of weld length for H-8 & H-9 welds, between jet pump banks, in area of AHCs. No indications identified
Core Spray Piping	1980-present	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13,
	1985	VT-1 (1 mil)	Cracking discovered at tee-box to header pipe weld. Welded repair plates installed on both header tee-boxes.
	1993	VT-1 (1 mil)	Cracking identified in downcomer slip joint (weld P-5), evaluation demonstrated structural margin for one operating cycle.

	1995	VT-1 (1 mil)	Additional cracking identified in 3 of 4 downcomer slip joint welds (P-5), repair clamps installed on all 4 downcomers to repair flawed welds.
	1997	VT-1	4 Downcomer repair clamps, no indications identified.
		EVT-1	All annulus piping welds, no indications identified.
	1999	VT-1	VT-1 Examination of A, B, C & D Downcomer Repair Clamps & both Header Teebox welded repairs. No indications identified.
	2001	VT-1	All target welds plus 25 % sample of piping butt welds examined. No indications identified.
		EVT-1	EVT-1 of all target welds plus 25% sample of butt welds examined. No indications identified.
	2003	VT-1	Four downcomer repair clamps.
		EVT-1	EVT-1 of all target welds plus 25% sample of butt welds. No indications identified.
	2005	EVT-1	Four Header Tee Box strong back repair plate welds. EVT-1 of all target welds plus 25% sample of butt welds. No indications identified.
	2007	EVT-1	Four Header Tee Box strong back repair plate welds. EVT-1 of all target welds plus 25% sample of butt welds. No indications identified.
		VT-1	Four downcomer repair clamps.
	2009	EVT-1	Four Header Tee Box strong back repair plate welds. EVT-1 of all target welds plus 25% sample of butt welds. No indications identified.
	2011	EVT-1	Four Header Tee Box strong back repair plate welds. EVT-1 of all target welds plus 25% sample of butt welds. No indications identified.
		VT-1	Four downcomer repair clamps.

	2013	EVT-1	Internal core spray piping from N5 nozzles to core shroud replaced eliminating previously installed downcomer and T-box repairs. EVT-1 performed on two hidden thermal sleeve welds with no indications identified.
Core Spray Sparger	1980-present	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13, No indications identified.
	1999	EVT-1	Examination performed on all Sparger Pipe welds.
		VT-1	Examination performed on all Brackets, Drains and 50 % of Nozzles. No indications identified.
	2003	EVT-1	Examination performed on all Sparger Pipe welds.
		VT-1	Examination performed on all Brackets, Drains and 50 % of Nozzles. No indications identified.
	2007	EVT-1	Examination performed on all Sparger Pipe welds.
		VT-1	Examination performed on all Brackets, Drains and 50 % of Nozzles. No indications identified.
	2011	EVT-1	Examination performed on all Sparger Pipe welds.
		VT-1	Examination performed on all Brackets, Drains and 50 % of Nozzles. ~1.0" Indication noted on the shroud side of the 136 degree bracket weld
	2013	VT-1	Examination performed on the core spray sparger bracket 05 at 136°. No change in the indication as identified during the 2011 inspection.

Top Guide (Rim, etc.)	1987	UT	UT examination performed on 40 cells. No indications identified
	1993	VT-3	Visual (VT-3) examination of 9 cells (02-19, 46-11, 42-59, 58-19, 02-39, 10-51, 18-03, 22-03, and 58-35), per SIL 554. No indications identified.
	1995	VT-3	Visual (VT-3) of 3 cells (14-23, 22-31, and 46-23) per SIL 554. No indications identified.
	1976-present	VT-3	VT-3 examination every other refueling outage per Section XI. No indications identified.
	1997	VT-3	Top Guide Grid examined from above, no indications identified.
		VT-1	Adjacent aligner pins at 180 and 270 deg.(per VIP-26), no indications identified.
	2009	EVT-1	EVT-1 of five top guide cell locations per BWRVIP-183 requirements. No indications identified.
	2011	EVT-1	EVT-1 of fourteen top guide cell locations per BWRVIP-183 requirements. No indications identified.
Core Plate (Rim, etc.)	1995	VT-3	VT-3 examination of hold down bolt retainers planned, deferred to 1997.
	1997	VT-1	Examined 18 of 34 bolts/retainers from above. No indications identified.
	2011	VT-3	Examined 9 of 34 bolts/retainers from above. No indications identified. This satisfies the 25% commitment from the submitted Deviation Disposition
SLC	1997	UT	UT of nozzle to safe end planned for 1997, per BWRVIP recommendations
		PT & UT	PT & UT of nozzle to safe-end weld, no indications identified.

	2003	PT	Extended dwell time PT of SLC nozzle to safe end weld and entire safe end. No indications identified.
	2007	PT	PT of SLC nozzle to safe end weld. No indications identified.
	2011	UT	UT of SLC nozzle to vessel and nozzle to safe end weld. No indications identified
Jet Pump Assembly	1974 to present	VT-3	Visual VT-3 of all jet pump components performed every other refueling outage. No indications identified.
	1981	VT & UT	VT and UT examination performed on all 20 hold down beams/ One beam found to be cracked, replaced with new style beam, All beams replaced with new style beam and reduced preload in 1988.
	1997	VT-3	VT-3 all 20 jet pump assemblies (all parts),including CSVT-1 (MVT-1) of 10 riser braces, including all welds. No indications identified.
		CSVT-1 (MVT-1)	CSVT-1 (MVT-1) all 10 thermal sleeve to riser elbow welds, plus UT on pumps 1/ 2, 9/10, 13/14 due to indications on thermal sleeve side of these welds. MVT-1 on welds RS-2 & RS-3 of three risers w/ indications @ 30, 150, and 300 degrees. Evaluation of indications justified continued operation for part cycle.
	1999	UT	Examinations performed on all 20 hold down beams. Reportable indications observed on hold down beam for jet pump # 20. Beam replaced. No other indications identified.

	1999	EVT-1	Examination of high priority Adapter welds on Jet Pumps 1-10. Reportable indications on welds (AD-3b) of Jet pumps 2 & 10. BWRVIP –41 evaluation resulted in use-as-is disposition. Expanded examinations to weld AD3b on Jet Pumps 11-20. No other indications identified. EVT-1 examination of high priority Diffuser Shell to Tailpipe Welds (DF-2) of Jet Pumps 1-10. No indications identified. Examination of Riser welds RS-2 & RS-3 of Jet Pump Assemblies 2, 3 & 4. No indications identified.
	2001	EVT-1	Reexamined weld AD-3b on Jet Pumps 2 & 10. indications remain bounded by existing flaw evaluation. All 20 WD-1 locations examined. 16 high priority and 45 medium priority welds on inlet mixers, diffusers, and riser braces also examined. No indications identified.
	2003	VT-1	VT-1 of all twenty hold down beam ratchet lock keepers (replaced in 2001). VT-1 all twenty WD-1 main wedge locations, since all inlet mixers were removed in 2001, Two auxiliary spring wedges installed in 2001, and the RS-1 repair clamp on JP 1 & 2 and 13 & 14. No indications identified.
		EVT-1	Reexamination of indication at RS-1 weld on JP 9 & 10. Minimal change in flaw size. Structural reevaluation completed for continued acceptability. 104% of High priority welds completed. 72% of Medium priority welds completed No indications identified. Indication identified in backing ring below AD-3a weld on JP 18. Structural evaluation found acceptable for continued operation.

	2005	UT	Two-sided UT of all diffuser and adapter welds (100) from I.D. Identified 4 small OD originating indications associated with the AD-3b fillet weld (2 previously ID'd). Structural and leakage evaluation proved acceptability for numerous operating cycles.
		VT-1	VT-1 of five main wedges. No wear identified.
		EVT-1	EVT-1 of 16 medium priority welds. No indications identified. EVT-1 of 3 existing indications. No appreciable change in indication size.
	2007	VT-1	VT-1 of 10 main wedges and 2 RS-1 riser repair clamps. No indications identified.
		EVT-1	EVT-1 of 30 medium and high priority welds, 1 existing RS-1 weld indication and 12 riser brace welds. No growth of existing indication noted. Small indications identified at the RS-1 weld of two risers. Structural and leakage impact evaluations found indications acceptable for continued operation. No other indications identified.
	2009	VT-1	VT-1 of 6 main wedges. Minor wear identified on 3 wedges. Expanded scope to examine all 20 main wedges and performed examinations on additional locations (AS-1/2, RS-6/7, RS-8, RS-9, MX-7) on the 3 JPs with identified wear. Two set screw gaps identified. No additional indications in expanded scope exams. No repair hardware required.
		EVT-1	EVT-1 of 31 medium and high priority welds. 3 existing RS-1 flaws were examined. – 1 existing indication exhibited no growth and was evaluated as acceptable for two cycles of continued operation. – 1 existing indication exhibited growth and was evaluated as acceptable for two cycles of continued operation. – 1 existing indication was determined to be the toe of the weld. No indication exists. No other indications identified.

	2009	VT-3	VT-3 of two aux spring wedges. No indications identified.
	2011	VT-1	A VT-1 of the BB-4 regions of all 20 JP hold down beams was performed with no indications identified. VT-1 examinations were performed on the following components with no indications identified: JP 01/02 RS-1 clamp, JP 13/14 RS-1 clamp, JP 04 MX-7 and JP 10 MX-7. Recordable indications were identified on 10 JP wedges, 3 wedges were existing wear no change, 2 JPs had new minor wedge wear and 5 had minor rod wear.
		EVT-1	EVT-1 of 53 medium and high priority locations • 2 existing RS-1 flaws were examined with no change in length • Set screw gaps identified on JP 03, 04 and 05
		UT	16 Hybrid Group 2 Hold Down Beams were examined no indications identified.
	2013	VT-1	VT-1 of 10 wedge bearing surfaces WD-1 JP01 thru WD-1 JP10 was performed. No relevant change in indications from previous inspection.
		EVT-1	EVT-1 of riser elbow to thermal sleeve weld RS-1 (JP 09/10 and JP 19/20). Previously documented indication was observed with no apparent change in the indication from the previous inspection data.
		EVT-1	EVT-1 of jet pumps JPs 03 and 05 vessel side and shroud side set screw gaps. EVT-1 of JP 04 vessel side set screw gap. New slight wear identified on the JP 03 SS, JP 03 VS and JP 04 VS belly band set screw interface. Comparison to P3R18 exam data identified these components had similar characteristics during the 2011 exam. No other indications identified.
Jet Pump Diffuser			See Jet Pump Assembly.

CRD Guide Tube	1985	VT-3	VT-3 PSI examination of 4 replacement CRD housings.
	1987	VT-3	VT-3 examination of one of replaced housings. No indications identified.
	1991	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
	1999	VT-3	VT-3 examination on Guide Tube welds CRGT-1 & Alignment Pin weld (Core Locations: 14-15, 14-31, 14-47, 18-19, 18-27, 18-35, 18-43, 26-11, 34-35, 42-19) No indications identified.
		EVT-1	EVT-1 examination on Guide Tube welds CRGT-2 & 3 (Core Locations:14-15, 14-31, 14-47, 18-19, 18-27, 18-35, 18-43, 26-11, 34-35, 42-19) No indications identified.
	2003	EVT-1	Best effort EVT-1 on Guide Tube welds CRGT-2 & 3 (Core locations: 10-35, 22-27, 22-35, 30-23, 30-31, 30-39, 38-27, 38-31, 38-35, and 42-31) No indications identified.
		VT-3	VT-3 examination on Guide Tube welds CRGT-1 & Alignment Pin weld (Core Locations: 10-35, 22-27, 22-35, 30-23, 30-31, 30-39, 38-27, 38-31, 38-35, and 42-31) No indications identified.
	2005	EVT-1	EVT-1 on Guide Tube welds CRGT-2 & 3 (Core locations: 22-39, 38-39, 14-35, 46-35, 46-27, 22-23, and 26-11) No indications identified. CRGT-3 (22-39) later disqualified.
		VT-3	VT-3 examination on Guide Tube welds CRGT-1 & Alignment Pin weld (Core Locations: 22-39, 38-39, 14-35, 46-35, 46-27, 22-23, and 26-11) Alignment pin weld also at 14-27 and 38-23, No indications identified.

CRD Guide Tube (cont.)	2007	EVT-1	EVT-1 on Guide Tube welds CRGT-2 (Core locations 22-03, 30-15, 42-03, 46-55, 58-39) and CRGT-3 (Core locations 22-03, 30-15, 42-03, 46-55, 58-39). No indications identified. Verification of CRGT-1 (Core locations 22-03, 30-15, 42-03, 46-55, 58-39) alignment pins and alignment lug welds. No indications identified.
	2009	EVT-1	EVT-1 on Guide Tube welds CRGT-2 (Core locations 14-31, 22-31, 22-59, 30-47, 50-51) No indications identified.
CRD Stub Tube	1991	VT-3	VT-3 of accessible portions of 12 stub tubes (30-35, 26-35, 22-35, 22-31, 22-27, 26-27, 26-23, 30-23, 34-23, 34-27, 34-31, 30-31). No indications identified.
In-Core Housing	1991	VT-3	VT-3 of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
Dry Tube	1997	N/A	All Dry Tubes replaced in 1985. All IRM and SRM tubes replaced w/ Wide Range Monitoring tubes in 1997. No inspections required.
Instrument Penetrations	1976 to present	PT	PT examination performed on all instrument nozzle to safe end welds once per interval, per Section XI. No indications identified.
	1997	PT	PT nozzle to safe-end (coupling) & safe-end to pipe welds on 2 nozzles. (N12A & N12B). No indications identified.
	2001	PT	PT nozzle to safe-end (coupling) welds on 2 nozzles. (N11A & N16A). No indications identified.
Vessel ID Brackets	1976 to present	VT-1 or VT-3	VT-1 and VT-3 of all ID bracket welds performed once per interval No indications identified.
	1997	VT-1	All 10 Jet Pump riser brace to vessel welds, no indications identified.

	1999	EVT-1	EVT-1 examination performed on 8 Core Spray Bracket Pads @ 15, 117, 123, 165, 195, 237, 243 & 345 AZ. No indications identified.
	2001	EVT-1	EVT-1 examination performed on 4 Feedwater Sparger brackets @ 4, 56, 64, and 116 Az., 3 Jet Pump Riser Braces @ 90, 120, and 150 AZ., and 2 Steam Dryer Support Brackets @ 4, and 94 AZ. No indications identified.
	2003	VT-1	Lower Surveillance Specimen brackets at 30°, 120°, and 300°.
		VT-3	Upper Surveillance brackets at 30°, 120°, and 300°. Guide Rod brackets at 0° and 180°.
		EVT-1 & VT-3	Steam Dryer support brackets at 184° and 274°.
		EVT-1	Jet Pump riser brace to vessel welds JP 9/10 and JP 13/14. No indications identified
	2005	EVT-1	8 Feedwater sparger bracket welds and 16 jet pump riser brace welds. No indications identified.
	2007	EVT-1	8 Core Spray pipe support brackets and one jet pump riser brace. No indications identified.
		VT-3	4 Steam dryer hold down bracket welds. No indications identified.
	2011	EVT-1	Steam dryer support brackets at 004°, 094°, 184°and 274° were examined with minor wear and rub marks found. The conditions were evaluated acceptable. The upper guide rod bracket attachment welds at 0° and 180° were examined with no recordable indications identified. The feedwater sparger brackets at the 030°, 090°, 150°, 210°, 270° and 330° sparger locations were examined with no recordable indications identified. The jet pump riser brace to vessel welds for JPs 01/02, 09/10, 11/12 and 13/14 were examined with no recordable indications identified.

LPCI Coupling			N/A for this plant
Steam Dryer	2003	VT-3	VT-3 of the entire top of the dryer (including all upper tie bars) and the 2 outer bank hoods and cover plates.
		VT-1	VT-1 of 5 new central bank upper tie bars (added in 2001), 2 stop-drilled indications at the lower guide rod followers, and all GE SIL 644, Supp. 1 locations on outer bank hoods. No indications identified. All previous repairs were satisfactory.
	2005	VT-1	Completed all remaining BWRVIP-139 recommended inspections (68 locations). No indications identified.
	2007	VT-1	VT-1 of 23 high stress welds and all upper tie bars. No indications identified
	2009	VT-1	Re-examination of six "red" end bank welds, two "green" drain channel welds, and welds on four lifting lugs per BWRVIP-139-A. No indications identified
	2011	VT-1-89	Examinations were performed on the end panel plate to cover plate weld, end panel plate to sloped hood plate weld and end panel plate to vain cap plate weld on both the left and right end of bank 6 of the steam dryer. No recordable indications were identified. The lifting rods at 045°, 135°, 225°and 315° were examined with no recordable indications.
	2013	VT-1	VT-1 examinations performed on steam dryer seismic brackets (SDSB) at 004°, 094° and 184°. No additional wear was observed from the previous examination. VT-1 on steam dryer lifting rod assemblies at 45°, 135°, 225° and 315°. A new indication was noted on the northeast tack weld of the 225° lifting rod. No recordable indications were identified on the other three lifting rod assemblies.

Steam Separator	2007	VT-1	VT-1 examinations performed on a sample of upper and lower shroud head bolt support ring gussets. No indications identified.
	2009	VT-1	VT-1 examinations performed on a sample of upper and lower shroud head bolt support ring gussets. No indications identified.
	2011	VT-1-89	Examinations were performed at four locations on both the lower support ring gussets and the upper support ring gussets. No recordable indications were identified. Examinations were performed on the separator standpipe tie straps minor historic damage was observed conditions were acceptable. A VT-1 examination was performed on shroud head bolt 07, indicator window and pin wear observed. As a result, SHB 07 was removed. The four lifting lugs were examined with no recordable indications identified.
	2013	VT-1	The four lifting lugs were examined with no recordable indications identified.
Dissimilar Metal Welds (BWRVIP-75-A)	2009		No examinations scheduled.
	2011		No examinations scheduled.
	2013		Examinations performed on 3 IGSCC Category A welds per BWRVIP-75-A. No recordable indications were identified. The welds examined were a pipe bend to pipe weld in the RHR system, the core spray nozzle to safe end weld and a recirculation inlet nozzle to safe end weld.