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BWR Vessel & Internals Project (BWRVIP)

(by e-mail)

June 30, 2017

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 2016 Outages

Enclosed are five (5) copies of the document entitled "BWR Vessel and Internals Project, Vessel Internals Inspection Summaries for Fall 2016 Outages, June 2017."

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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PALO ALTO OFFICE
3420 Hillview Avenue, Palo Alto, CA 94304-1395 USA • 650.855.2000 • Customer Service 800.313.3774 • www.epri.com

BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Fall 2016 Outages

June 2017

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Reactor Internals Inspection History

Plant: **Browns Ferry Nuclear Plant: Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	2005	UT	Baseline: UT (two-sided) examination of H1, H2, H3, H4, H5, H6, H7 performed per BWRVIP-76. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 83.0% / 0.0% H1 / Lower / 82.1% / 2.1% H2 / Upper / 81.8% / 0.4% H2 / Lower / 88.7% / 0.0% H3 / Upper / 88.7% / 0.0% H3 / Lower / 79.2% / 5.1% H4 / Upper / 90.0% / 20.1% H4 / Lower / 89.6% / 2.6% H5 / Upper / 91.3% / 1.2% H5 / Lower / 91.3% / 0.0% H6 / Upper / 91.9% / 0.0% H6 / Lower / 91.9% / 11.2% H7 / Upper / 91.4% / 12.0% H7 / Lower / 78.0% / 0.0%
	2016	UT	Reinspection per BWRVIP-76, UT (two-sided) examination of H1-H7; Baseline per BWRVIP-76, UT examination of V3 and V4. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 84.6% / 0.0% H1 / Lower / 87.8% / 1.2% H2 / Upper / 87.9% / 0.3% H2 / Lower / 87.0% / 0.0% H3 / Upper / 86.8% / 0.0% H3 / Lower / 86.9% / 5.8% H4 / Upper / 97.5% / 23.4% H4 / Lower / 98.3% / 4.8% H5 / Upper / 92.1% / 0.0% H5 / Lower / 92.7% / 0.0% H6 / Upper / 93.2% / 0.0% H6 / Lower / 100.0% / 4.2% H7 / Upper / 100.0% / 2.4% H7 / Lower / 100.0% / 0.0%

			V3 / CCW Side / 96.5% / 0.0% V3 / CW Side / 88.7% / 0.0% V4 / CCW Side / 87.8% / 0.0% V4 / CW Side / 87.7% / 0.0%
Shroud Support	2005	VT-1, VT-3	Access Hole Cover Welds at 0° and 180°: Replacement required prior to Unit 1 Restart - Both access hole covers replaced with bolted repair design per DCN 51193. VT-1 visual baseline exam performed to inspect nut to retainer tack welds only. VT-3 visual baseline exam performed to document the as-left condition of the AHCs. No relevant indications on either cover.
		EVT-1	Baseline inspection per BWRVIP-104 of the H8 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. No relevant indications.
		EVT-1, UT	Baseline inspection per BWRVIP-104 of the H9 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. Also performed UT from the outside surface of the RPV obtained from access of the N1A and N1B (Recirculation outlet nozzles) windows. Achieved coverage was calculated to be 19%. No relevant indications.
		VT-3	Baseline inspection per BWRVIP-104 of the H10 and H12 welds at 0 and 180 degrees. These inspections were performed through the access hole cover openings during the repair. No relevant indications.
	2008	VT-3	VT-3 visual inspection of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and

			the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
	2012	EVT-1	Reinspection of Shroud Support weld H-8 (EVT-1) at 0° and 180° per BWRVIP-38. No reportable indications were found.
	2016	EVT-1	Reinspection of Shroud Support weld H-9 (EVT-1) per BWRVIP-104. No reportable indications were found. Visual inspection per BWRVIP-180 (VT-1 from the top surface) and vendor recommendation (VT-3) of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
Core Spray Piping	2001	UT	Baseline inspection per BWRVIP-18: UT of T-Box welds @ 120 (P2) and 240 degrees (P2, CP3). UT of elbow and sleeve welds for Downcomers A through D (P4a, P4b, P4c, P5, P6, and P7). No relevant indications.
	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations (T-Box welds @ 120 (P1, AP3, BP3) and 240 degrees (P1, DP3), Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees). EVT-1 visual examinations of elbow and sleeve welds for Downcomers A through D (P4d, P8a, P8b). No relevant indications.
	2008	EVT-1	Reinspection per BWRVIP-18-A: EVT-1 visual inspections of T-Box Welds (P1 (120° & 240°), AP3, BP3, DP3) and Downcomer Welds (AP4d, A-D8a, A-D8b); no relevant indications were observed.
	2010	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds

			@120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. UT of elbow and sleeve welds (P4a, P4b, P4c, P4d, P5, P6, P7, P8a, & P8b) performed for Downcomers A through D. Two indications (1.04" and 2.20") observed on weld P4a on A Downcomer on the pipe side of the weld. Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R9 (2012). Supplemental EVT-1 visual inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2012	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
	2014	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees); no relevant indications were observed. UT of elbow weld P4a performed for Downcomer A and elbow welds P4a, P4b, P4c, & P4d performed for Downcomer B. Two indications observed on Weld P4a on Downcomer A were resized (0.40" and 2.37") and two additional indications were identified (0.52" and 0.23"). Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R11 (2016). UT of sleeve welds (P5, P6, P7, P8a, & P8b) performed for Downcomers A through D; no relevant indications were observed. Supplemental EVT-1 visual

			inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2016	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
Core Spray Sparger	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations of sparger welds (S1, S2, S4). BS2-R weld @ 9 degrees (Sparger to T-Box Weld, R side (Lower Sparger) recorded a crack adjacent to the weld and was structurally replaced by weld repair clamp per DCN 51193. AS2-R weld @ 354 degrees (Sparger to T-Box Weld, R side (Upper Sparger) recorded a pin hole adjacent to the weld and evaluated as "accept as is". Otherwise, no relevant indications.
		VT-1	Baseline inspection per BWRVIP-18: VT-1 visual examinations of sparger welds (S3a, S3b, S3c, Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees). No relevant indications.
	2008	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger welds (S1, S2, and S4) and VT-1 visual examinations of Sparger welds (S3a, S3b, and S3c) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2012	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger A, C, D welds (S1 and S2 [L & R]), and Sparger A, B, C, D welds (S4 [L & R]) and VT-1 visual examinations of Sparger A, B welds (S3a, S3b, and S3c [L & R]) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2016	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
Top Guide (Rim, etc.)	2005	VT-3	Baseline inspection (NON-BWRVIP): VT-3 visual examinations of Locations 4 (Grid Beam to Rim Top / Bottom Cover Plate Pins), 6 (Fuel Guard Weld and Bolting), 12 (Rim & Cover Plate Fabrication Weld), and 13 (Eye Bolt Boss). 1 area recorded as a condition on the plate (Location 12), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1	Baseline inspection (NON-BWRVIP): EVT-1 visual examinations of Locations 1 (Grid Beam & Beam to Beam Crevice Slot) and 10 (Rim Pins). 3 areas recorded as not acceptable (Location 1), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1, VT-1	Baseline inspection per BWRVIP-26: Inspected Rim Welds (Location 11) (EVT-1) and Aligner Pins (Locations 2/3) (VT-1) at all locations. No relevant indications.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
	2014	EVT-1	Baseline (2014) per BWRVIP-183: Location 1 (Grid Beam and Beam-to-Beam Crevice Slot) inspected for ten grid beam cells; no reportable indications.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
Core Plate (Rim, etc.)	2005	EVT-1, VT-3	Baseline inspection per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were EVT-1 inspected from the top side, and seventeen (17) holddown bolts (50%) were inspected from the bottom side with no reportable indications. All one hundred twenty-nine (129) plugs (Location 13) were VT-3 inspected; three plugs were replaced.
	2008	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Three (3) core plate plugs replaced during Unit 1 Recovery were VT-3 examined to confirm that the replacement plug was in place. No evidence of movement, wear, or misalignment was visible.
	2010	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2012	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2014	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2016	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
SLC	2007	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.

	2008	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
	2014	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
		UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
Jet Pump Assembly	2005	UT, VT-1	Baseline (2006) per BWRVIP-41, -138: UT of holddown beam locations BB-1, BB-2, and BB-3 (Jet Pumps 1 thru 20) - no reportable indications. Baseline (2005) per BWRVIP-41 of all High and Medium Priority Weld locations. Circumferential crack indication in backing ring for DF-3 weld (Jet Pump 19) will be inspected for change during U1C7 RFO in Nov. 2008.

			Baseline (2005) per BWRVIP-41: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); No wedge wear observed. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified nine (9) set screw gaps ranging from 12 to 35 mils in width. Two reportable linear indications identified on one of two set screw tack welds for Jet Pump Nos. 15 (shroud-side) and 16 (vessel-side). Nine (9) auxiliary wedges installed on Jet Pumps 2, 3, 4, 6, 7, 8, 10, 12, and 14.
	2008	VT-3	VT-3 visual examination of the holddown beam for Jet Pump #8 was performed in response to misalignment concerns raised during Unit 1 Recovery and an RFI identified during the October 2007 INPO BWRVIP Review Visit. There was a minor misalignment with the beam but no relevant indications were observed.
			VT-3 visual examination of sensing line clamps installed during Unit 1 Recovery on Jet Pumps 1-5 and 11-15 performed to confirm that all of the repair hardware is in place and that the hardware has not shifted or changed from the as-installed condition. No relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was previously recorded during Unit 1 Recovery and does not appear to have changed.
		VT-1	Reinspection per BWRVIP-41 R1: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted. Indication of vertical wedge movement at ten (10) locations was observed, but the movement markings did not appear to be recent and correlated

			with findings during the Unit 1 Recovery examinations. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified no new set screw gaps. Inspection results identified eight apparently new set screw tack weld indications in addition to the two set screw tack weld indications that were previously observed during Unit 1 Recovery. Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery were inspected to verify contact; no relevant indications were observed.
	2010	EVT-1	Reinspection per BWRVIP-41, Rev. 3: EVT-1 of Medium Priority Locations RS-8 and RS-9 (Jet Pumps 1 thru 20) performed in accordance with BWRVIP Letter No. 2009-202 ("Interim Guidance for Accelerated Inspections of Jet Pump Riser to Riser Brace Welds and Wedges"); no relevant indications.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was unchanged from U1R7.
		VT-1	Reinspection per BWRVIP-41 R3: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted; three new instances of minor wedge wear since U1R7 noted at Jet Pumps 1, 6, and 10 determined to be the result of routing service during operation. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified one new set screw gap (Jet Pump 20: Shroud-Side Set Screw - 17 mils). Evaluation performed to provide one fuel cycle (U1C9) of continued operation.

			Inspection results identified two apparently new set screw tack weld indications on Jet Pump 17 in addition to the nine set screw tack weld indications that were previously observed during U1R7 (NOTE: An indication that was identified during U1R7 for Jet Pump 14 was accidentally counted twice). Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle (U1C9).
	2012	UT, EVT-1, VT-1	Reinspection per BWRVIP-41 R3, -138 R1: UT of holddown beam locations BB-1 and BB-2, (Jet Pumps 1 thru 20) - no reportable indications. Reinspection per BWRVIP-41 R3: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, & RS-7 (Jet Pumps 1 thru 6); IN-4, MX-2, & DF-1 (Jet Pumps 1 thru 5); no reportable indications. EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, & AD-3b (Jet Pumps 1 thru 10); linear indication (0.5 inches long) observed in heat-affected zone above the AD-1 weld for Jet Pump 6 was evaluated using Jet Pump Flaw Evaluation Handbook and was deemed acceptable. Otherwise, no reportable indications. EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. An additional indication was observed when a stain was reclassified; both indications were unchanged from U1R8, however. VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on five jet pumps (Jet Pumps 1, 10, 12, 17, & 18);

			significant increase in wedge wear for Jet Pump 6 necessitated a repair (aux wedge installed on the Shroud-Side Set Screw (SS-SS) for Jet Pump 6 to stabilize the restrainer bracket assembly); RS-8 and RS-9 welds for Jet Pump 6 examined (EXPANDED SCOPE) to insure no degradation was present - no recordable indications.
	2012	VT-1	VT-1 performed of Set Screw Locations AS-1 and AS-2 for Jet Pumps 1 thru 20. Backlighting identified three (3) set screw gaps (1 existing and 2 new) one of which (SS-SS for Jet Pump 18) measured at 9 mils and the other two (Vessel-Side Set Screw) VS-SS for Jet Pump 17 & SS-SS for Jet Pump 20) each measured at 20 mils, which exceeded the 15-mil screening criteria for installation of an auxiliary spring wedge but did not exceed the 20-mil criteria above which the potential exists for high level jet pump vibration. Gaps were corrected by tapping down on main wedge, so no additional auxiliary wedges installed. 17 set screw tack weld indications (11 existing and 6 new) were identified during U1R9. SS-SS on Jet Pump 17 was found backed out to shroud wall due to tack weld failure. SS-SS was restored to its original position and repaired (staked and an aux wedge added). Four additional set screws (Jet Pump 11 VS-SS, Jet Pump 13 SS-SS, Jet Pump 15 SS-SS, and Jet Pump 16 VS-SS) were found to have both tack welds broken and were staked and an aux wedge added. Remaining set screws had only 1 of 2 set screw tack welds and were acceptable as-is.
	2014	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on nine jet pumps (Jet Pumps 1, 6, 8, 9, 10, 12, 16, 17, & 18. Observed downward movement of the wedge for Jet Pumps 9

			& 12 led plant to conservatively inspect unrepaired adjusting set screws for both pumps – no reportable indications; minor wedge wear on all other jet pumps was unchanged. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery and six (6) auxiliary spring wedges installed during U1R9 (2012) were inspected to verify contact; no relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; indication was unchanged from U1R9 in 2012. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R9 in 2012.
	2016	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); indications of minor wear on nine jet pumps (Jet Pumps 1, 2, 5, 6, 9, 10, 12, 16, & 17). Adjusting set screws (AS-1 and AS-2) for five jet of the pumps (1, 2, 6, 9, & 10) conservatively added to scope to ensure no vibration-related damage was occurring; no set screw gaps nor new tack weld cracking observed; no slip joint clamps were required to be installed.

			3gaps observed during last set screw gap inspection during U1R9 were reinspected (Jet Pump 17, VS-SS - no gap observed; Jet Pump 18, SS-SS - no gap observed; Jet Pump 20, SS-SS - 13-mil gap); no aux wedges were required to be installed. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Four (4) auxiliary spring wedges inspected as part of expanded scope had relevant indications, so all 15 aux wedges installed on Unit 1 were inspected. 14 of 15 wedges had minor wear but none was judged serious enough to prevent wedges from performing their design function.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed during U1R9 & U1R10 in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; after cleaning the indication was re-identified as a scratch. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R10 in 2014 and upon evaluation were determined to be acceptable for one fuel cycle.
Jet Pump Diffuser	N/A	N/A	Diffuser exams reported in above jet pump assembly inspection results.

CRD Guide Tube	2005	EVT-1, VT-3	Baseline per BWRVIP-47: 19 control rod guide tubes (10% of total) examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual examination of Locations CRGT-2 and CRGT-3; no reportable indications.
CRD Stub Tube	2005	VT-3	VT-3 examinations performed for accessible areas for 145 stub tubes at various core locations. No damage or distortion was noted.
In-Core Housing	N/A	N/A	N/A
Dry Tube	2006	VT	All twelve (12) SRM/IRM dry tubes replaced with modified design which is resistant to cracking. Inspections will be scheduled after dry tubes have reached the expected 20-year life (2027).
Instrument Penetrations	2007	VT-2	Visual leak check is performed during Unit Startup. No reportable indications reported.
	2008	VT-2	Visual leak check performed during Unit Startup. Leak observed in safe-end to pipe weld for N11B instrumentation nozzle was repaired with weld overlay.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2014	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.

		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported. Visual leak check performed during Unit Startup. No relevant indications reported.
Feedwater Sparger	2005	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications. VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2008	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2010	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor impact damage observed on 175° Bracket (acceptable as-is), but otherwise no relevant indications were observed (no pin wear).
	2012	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor wear observed under the retaining pin for the end bracket at one new location (55°) when compared to U1R8 (2010) inspection results. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R10 in 2014 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of

			any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R8.
	2014	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications.
		VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R11 in 2016 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R9 in 2012.
	2016	VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R12 in 2018 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R10 in 2014.
Vessel ID Brackets	2005	EVT-1	Jet Pump Riser Brace Welds (40) examined (EVT-1): No recordable indications.

			Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): Damage to upper right corner and an indication extending from the damaged corner of the dryer support bracket located at 274° was repaired during Unit Recovery. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications.
	2012	EVT-1	Jet Pump Riser Brace Welds (12, Jet Pumps 1-6) examined (EVT-1): No recordable indications.
	2014	EVT-1	Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications.
	2016	EVT-1	Jet Pump Riser Brace Welds (Jet Pumps 7-20) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): No recordable indications. Attachment weld at 184° only received a VT-3 examination due to heavy crud buildup and will be cleaned and inspected to the proper exam method during U1R12 in 2018. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications. Guide Rod RPV Attachment at 0°: Indication on tack weld at the upper guide bracket to the Guide rod observed during Section XI Code examination.
LPCI Coupling	N/A	N/A	Not applicable to this plant

Steam Dryer	2005	VT-1	Full baseline inspection performed in accordance with BWRVIP-139 and GE SIL 644 R1. Three Drain Channel Vertical Welds were found to have indications, and were repaired with weld overlays.
	2008	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were VT-1 visually examined and confirmed. No change in condition was noted from what was previously reported. General visual inspection (pre-EPU baseline) performed in accordance with BWRVIP-139 and GE SIL No. 644 R1; no relevant indications were observed.
	2008	VT-1	In preparation for ascension to EPU and operation at EPU conditions, various steam dryer modifications were performed. All thirteen (13) Steam Dryer Tie-Bars were replaced with a new design and three (3) additional steam dam gussets on each steam dam were added to the Steam Dryer. A visual (VT-1) inspection was performed to document the as-left condition.
	2010	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R7.
	2012	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R8. Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed

			condition; no relevant indications were observed.
	2014	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R9 (2012).
	2016	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R10 (2014). Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed condition; no relevant indications were observed. Four (4) BWRVIP-139-A "Red Welds" (welds associated with dryer integrity) were visually inspected (VT-1). Three of the welds were found to have been removed during U1R7 modifications, the fourth had no relevant indications when examined.
Steam Separator	2010	VT-3	Steam Separator tie bars (cross bracing) examined for signs of cracking (Reference: INPO OE 30657). No relevant indications were observed on the cross bracing, but a minor dent was recorded at the top of a standpipe located in the southeast corner of the separator that was acceptable as-is.
DM Welds - BWRVIP-75-A Cat. C	2008	UT	3 welds inspected (RCRD-1-33, CS-1-002-008, CS-1-002-033A): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).

	2012	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R10).
	2016	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R11).
DM Welds - BWRVIP-75-A Cat. D	2008	UT	2 welds inspected (DRHR-1-2, DRHR-1-11): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).
	2012	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 10 (U1R10).
	2016	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 11 (U1R11).

Reactor Internals Inspection History

Plant: **Cooper Nuclear Station**

Component in BWRVIP Scope	Date of Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud	Fall 1995 (RE15)	UT	Baseline UT performed on welds H1 through H7 per BWRVIP guidelines. Indications identified in 4 circumferential welds. No examinations on vertical welds. No repair required.
	Spring 2005 (RE22)	UT	UT examinations were performed on welds H-1 through H-4 including a portion of vertical weld V16. Examination of welds H5-H7 was deferred to fall 2006. Single sided UT examinations were performed on welds H-1 through H-3 with welds H-4 and vertical weld (V-16) receiving dual sided examinations. Percentage of welds examined: H1 (54.9%), H2 (55.7%), H3 (63.9%), H4 (58.4%). The previously identified eight (8) flaws in H1 showed a net decrease in length. No new flaws in H2 were identified. The eight (8) flaws in H3 were reexamined with one (1) new flaw identified for a total increased change in flaw length relative to total weld length of 7.5 %. Two (2) new minor flaws were discovered in the HAZ of H4. In addition, a total of eleven (11) minor indications were identified in the base metal adjacent to H4. Six (6) of the indications exhibited characteristics associated with Stress Corrosion Cracking (SCC) in areas subjected to cold working during the shroud fabrication/installation process. The remaining five (5) indications did not exhibit characteristics of SCC but appeared to exhibit characteristics commonly observed from localized attachment removal sites. The indications were determined to be acceptable by analysis. No indications were observed in the vertical weld.

	Fall 2006 (RE23)	UT	UT examinations were performed on welds H5, H6a, H6b, and H7 using phased array. Two (2) sided examinations were performed on all welds except H7 that received a one-sided UT examination. Coverage was estimated at greater than 72% for welds H5, H6a, and H6b. H7 received greater than 53% coverage. A previously identified indication in H5 was re-examined with no apparent change. A previously identified indication in H6a was re-examined with no apparent change. A new minor indication was discovered in weld H6b in an area previously scanned in RE16 (1995). Two (2) new minor indications were discovered in weld H7, one in a previously scanned location and the other in an area not previously scanned.
		VT-3	VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Discovered an indication approximately ten (10) inches long behind JP-19. Analyzed as acceptable.
	Spring 2008 (RE24)	VT-3	Performed first ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Spring 2011 (RE26)	VT-3	Performed second ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Fall 2014 (RE28)	UT	UT exams were performed on the H1 thru H7 welds along with the V16 and base material flaw behind JP19. The previously identified indications showed no apparent changes in growth and none were through wall.
			VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Also performed third ASME B-N-2 VT-3 successive examination of flaw

			discovered in base metal behind JP-19. No changes in the indication.
Shroud Support/ Access Hole Covers	1993-1995	VT-3 and UT	VT-3 examinations of welds on 50% of core plate each outage. No indications. UT of access hole covers (AHC) in 1993. No indications.
	Spring 1997 (RE17)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC in accordance with GE SIL 462. No indications.
	Fall 1998 (RE18)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 of AHC's in accordance with GE SIL 462. No indications. VT-1 of gusset plate welds between 0-180° to B-N-2.
	Spring 2000 (RE19)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC's in accordance with GE SIL 462. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on 17% of the H8 and H9 welds. EVT-1 examinations on 6 gusset welds and AHC's. No indications.
		UT	UT examination of AHC's. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examinations on four (4) gusset welds. No indications.
	Spring 2005 (RE22)	UT	UT examinations on 11.7% of the H9 weld length. No indications
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations performed on approximately 16% of H8 weld length with no relevant indications. EVT-1 examinations of AHC per SIL462. No indications.

	Spring 2008 (RE24)	EVT-1	EVT-1 examinations performed on accessible lengths of welds on seven (7) gussets. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 examinations on 16.7% of the H8 weld. EVT-1 examinations on accessible lengths of welds on two (2) gussets @ 195° and 315°. No indications.
	Fall 2014 (RE28)	UT/EVT-1	UT performed on H9 with 13.4% coverage. EVT-1 performed on both AHC's. No indications.
Core Spray Piping	1980's to 1995	VT-1/VT-3	IEB 80-13 examinations of piping and welds in annulus. Three (3) indications identified in Fall 1995 outage by EVT-1. No repair required.
	Spring 1997 (RE17)	UT	UT examination of CS P8a and P8b welds. Indications on one P8a and P8b welds (first discovery). Evaluated as acceptable.
		EVT-1	EVT-1 examinations on balance of piping.
	Fall 1998 (RE18)	UT	UT examinations on the P8a and P8b indications were re-examined.
		EVT-1	Balance examined by EVT-1. No visual indications.
	Spring 2000 (RE19)	UT	UT examinations on P8a and P8b welds with indications. No repair required.
		EVT-1	EVT-1 of P3, P4, P5, P6, and P7 welds. No visual indications.
	Fall 2001(RE20)	UT	UT examinations on P3's, three (3) P4's, P5's, P6's, P7's, P8a's and P8b's. EVT examinations of thirty-one of the CS piping welds.
		EVT-1	EVT-1 examinations on fifteen (15) welds. Indications re-examined on P8a weld and P8b welds.
	Spring 2003 (RE21)	UT	UT examinations on all P8a and P8b welds. Identified three (3) flaw indications on one P8b weld and one (1)

			flaw indication on one P8a weld. No change in length.
		EVT-1	EVT-1 examinations on both junction box covers and accessible portions of both P1's, 2 - P2's, 4 - P3's, 1-P4a , 1-P4b, 1-P4c, 1-P4d. EVT-1 all P8a and P8b welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations of both P1's . The examination revealed that the P1 weld is not a creviced weld based on the presence of an external weld on the tee box near the nozzle thermal sleeve. EVT-1 examinations were performed on both P2 welds, the four (4) P3 welds, the 4a – 4d welds at 190° , the P5's, P6's, and P7's, the four (4) P8a's, and four (4) P8b's.
	Fall 2006 (RE23)	UT	UT examinations of P8b welds. Previous indications showed no change in size.
		EVT-1	EVT-1 examinations of piping welds and bracket attachment welds. No new relevant indications observed.
	Spring 2008 (RE24)	EVT-1	EVT-1 of indication near P1 at 90°. No change. EVT-1 of P1 at 270°. EVT-1 of P2's and P3's at 90° and 270°. EVT-1 of P4a, -b, -c, and -d at 170° EVT-1 of P5's, P6's, and P7's at 10°, 170°, 190°, and 350°.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations near P1welds at 90° and 270°. No change with the indication near the P1 at 90° (Loop A). EVT-1examinations of the four (4) P3, P5, P6 and P7 welds, EVT-1 examinations of downcomer welds P4a, P4b, P4c, and P4d at 10° . EVT-1 examinations of four (4) P8a and P8b welds. No change with visual indication of P8b at 10°.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.

	Spring 2011 (RE26)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° (Loop A). No change to the indication. EVT-1 of area adjacent to P1weld at 270°. No indications. EVT-1 of the P2 welds at 90° and 270°. EVT-1 of the four (4) P3, P5, P6, and P7 welds. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 190°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a, & P3b @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. No indications. EVT-1 of area adjacent to P1weld at 270° on B Loop,. No indications. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 350°. No indications. Loops A & B, EVT-1 of the bracket attachment welds PB @ 30°, 150°, 210°, and 330°. No indications.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.
	Fall 2014 (RE28)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a & P3b welds @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 170°. No indications observed.

			Loop B EVT-1 of area adjacent to P1weld at 270°. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. No indications observed.
	Fall 2016 (RE29)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 10°. No indications EVT-1 of two (2) P8a and two (2) P8b welds at 10° and 170°. No change with visual indication of P8b at 10°. Loop B EVT-1 of two (2) P8a and two (2) P8b welds at 190° and 350°. No indications.
Core Spray Sparger	1980's to 1995	VT-1/UT	IEB 80-13 of welds on sparger. No indications.
	Spring 1997 (RE17)	EVT-1	EVT-1 examinations of sparger welds and brackets per BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C identified. No other indications.
	Fall 1998 (RE18)	EVT-1	EVT-1 examinations of sparger welds and brackets inspected in accordance with BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C was reconfirmed. No other indications.
	Spring 2000 (RE19)	EVT-1	EVT-1 examinations of sparger and brackets. Five (5) indications evaluated as acceptable.
	Fall 2001 (RE20)	VT-1	VT-1 of 25% of S3a, S3b, and S3c welds. No indications.
		EVT-1	EVT-1 examinations of all S1, S2, and S4 welds examined with no indications.
	Spring 2003 (RE21)	VT-1	VT-1 of 25% of S3a & S3b's and all bracket welds. No indications.

		EVT-1	EVT-1 examinations of two S1,s, two S2,s, both XTRW welds near t-boxes, and four (4) S4 welds. No indications.
	Spring 2005 (RE22)	N/A	Sparger examinations deferred to fall 2006 (RE23).
	Fall 2006 (RE23)	VT-1	VT-1 on 50% of the S3a, S3b, and S3c welds and 100% on sparger brackets. No indications.
		EVT-1	EVT-1 on 100% of S1's and S2's and S4's. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 90°, 92°, 119°, 149°, 210°, 241° and 268°.
		EVT-1	EVT-1 examinations of S1's and S2's at 170° and 190°. EVT-1 examinations of S3a, S3b at 92° to 269°. EVT-1 examinations of S3c at 99°. EVT-1 examinations of S4's at 91° and 269°.
	Fall 2009 (RE25)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 272°, 299°, 30°, 329°, 61°, 88° and 270°.
		EVT-1	EVT-1 examinations of S1 and S2 and at 10° and 350°. EVT-1 examinations of two (2) additional welds near the 350° tee-box S2 welds.
	Spring 2011 (RE26)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications.
		EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4 @ 91° & 269°. No indications. EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4@ 91° & 269°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 on A sparger, S1 @ 10, S2 @ 8° & 12° and S4 @ 89° & 271°. No indications.

			EVT-1 on B sparger, S1 @ 350°, S2 @ 348° & 352°, XTRW welds near T-box @ 346° & 354°, and S4 @ 89° & 271°. No indications.
		VT-1	VT-1 on the B sparger, S3a & S3b @ 271°-89° and S3c @ 279°. No indications.
			VT-1 of the sparger brackets at 30.5°, 61°, 88°, 270°, 272°, 299°, and 329.5°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4@ 91° & 269°. No indications observed.
			EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4's@ 91° & 269°. No indications observed.
		VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets (SB) at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications observed.
Top Guide (Rim, etc.)	1991-1995	VT	VT of top guide beams of fifty (50) cells was performed in 1991 per RICSIL 059. No indications. VT exams of the members in the load path between the top guide and core shroud in 1995 per SIL 588. One (1) indication on the 90° aligner pin keeper was observed and evaluated as acceptable (indication not on load bearing portion of assembly).
	Spring 1997 (RE17)	VT -1	VT-1 re-examination of Top Guide Aligner Pin located at 90° in accordance with SIL 588, R1. Indication on aligner pin keeper did not appear to change in size.
	Spring 2000 (RE19)	VT -1	VT-1 of two (2) hold down assemblies. No indications.
	Fall 2001 (RE20)	VT -1	VT-1 of two (2) horizontal aligner pins with no new indications. VT-1 of four (4) hold down assemblies.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld.
	Fall 2006 (RE23)	VT-1	VT-1 on two (2) hold down assemblies and aligner pin assemblies at 90° and 270°. A previous indication identified on the non-load bearing keeper of the aligner pin assembly at the 90° location was observed with no apparent change. However, two (2) new but similar type indications were also observed on the same keeper. Three (3) new indications were observed on the non-load bearing aligner pin keeper at the 270° location. Indications were evaluated as acceptable.
		VT-3	VT-3 examinations performed on accessible areas of top guide per B-N-2. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 0 and 180°. One (1) new indication identified on non-structural keeper at 180°. Similar to indications in keepers seen at 90° and 270°. Evaluated as acceptable.
		EVT-1	EVT-1 examinations of accessible areas of Rim weld.
		VT-3	VT-3 examinations performed of accessible top guide hold down assemblies, rim pins per B-N-2.
	Fall 2009 (RE25)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 90°. No change in the indication at the 90° aligner pin keeper.
		EVT-1	EVT-1 examinations of 10% or fourteen (14) of top guide grid beams per BWRVIP-183. No indications. However, only eight (8) were credited as quality examinations.
		VT-3	VT-3 examinations of accessible areas of top guide per B-N-2.

	Spring 2011 (RE26)	VT-3	VT-3 of accessible areas of Top Guide per B-N-2. No indications.
		VT-1	VT-1 for BWRVIP-26 credit was performed on the Hold Down assemblies and Aligner Pin assemblies at 270°. An indication not previously reported was observed adjacent to the attachment weld adjoining the Aligner Block to the Top Guide. Indication appears to be a manufacturing remnant that was not completely removed during construction. Previously identified indications were also observed with no changes. Scope was expanded to include the remaining other three (3) Aligner Pin assemblies located at 0°, 90°, and 180°. VT-3 for Sect. XI B-N-2 and VT-1 for BWRVIP-26 credit was performed. Aligner Pin assembly at 0° was found to have seven (7) previously unidentified indications, with four (4) identified in the Aligner Pin Keeper and three (3) identified in the Aligner Block. Review of previous inspection video showed faint presence of indications. Evaluated as acceptable. Aligner Pin assembly at 90° was found to have one (1) previously unidentified indication located on the Aligner Pin Keeper. Review of previous inspection video showed a faint presence of the indication. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable. Aligner Pin assembly at 180° was found to have two (2) previously unidentified indications located on the Aligner Pin Keeper. Review of previous inspection video shows presents of indications. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld. EVT-1 of two (2) top guide cell locations per BWRVIP-183. No indications.
	Fall 2012 (RE27)	VT-1	VT-1 examinations performed on hold down assembly at 180°. No indications.
		VT-1	VT-1 of the aligner pin assembly at 0° was performed to confirm seven (7) flaws identified in RE26. Four (4) of the flaws on the keeper were confirmed and verified to have no changes. One (1) flaw on the aligner pin block was confirmed and verified to have no changes. The two (2) other previously identified flaws on the block were determined to be non-relevant surface scratches. VT-1 of the aligner pin assembly at 90° was performed to confirm seven (7) flaws identified on the keeper in RE26. 4 of the flaws were confirmed and verified to have no changes. One (1) additional flaw on the keeper was also reported. This flaw is similar to flaws seen on the other aligner pin keepers, but could not be verified in previous video due to camera positioning. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) flaws identified in RE26. All of the flaws on the keeper were confirmed and verified to have no changes. VT-1 of the aligner pin assembly at 270° was performed to confirm four (4) flaws identified in RE26. Three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) previously reported flaw adjacent the aligner block to top guide weld was examined using an improved camera and delivery mechanism and determined to be a non-relevant surface scratch.
	Fall 2014 (RE28)	EVT-1	EVT-1 examinations of accessible areas of Rim weld. No indications

		VT-1	VT-1 examinations performed on accessible top portion of the TG hold down assembly at 0°. No indications. VT-1 of the aligner pin assembly at 0° was performed to confirm five (5) previously identified flaws. Four (4) flaws on the keeper were confirmed to have no changes. The identified flaw on the aligner pin block showed slight increase in length. VT-1 of the aligner pin assembly at 90° was performed to confirm five (5) previously identified flaws. The 5 flaws on the keeper were confirmed to have no changes. Five (5) unreported flaws on the aligner block were detected. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) previously identified flaws. The three flaws on the Keeper were confirmed to have no change. Five (5) unreported flaws on the aligner block and two (2) on the top guide were detected. VT-1 of the aligner pin assembly at 270° was performed to confirm three (3) previously identified flaws. The three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) unreported flaw on the aligner block and one (1) on the top guide were detected.
		EVT-1	EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No crack indications identified.
	Fall 2016 (RE29)	EVT-1	EVT-1of five (5) of top guide grid beams per BWRVIP-183. No indications. EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No indications identified.

		VT-1	VT-1 of accessible top portion of the TG hold down assembly at 90°. No indications.
		VT-1/ EVT-1	VT-1 and EVT-1 of aligner pin assembly at 0° confirmed five (5) previously identified flaws. All flaws showed no changes, except for Flaw 6 on the keeper which appeared longer compared to previous examination but difference was attributed to improved tooling and lighting.. VT-1 and EVT-1 of aligner pin assembly at 90° confirmed ten (10) previously identified flaws on the keeper and block. All flaws showed no changes except for, Flaw 5 (keeper) and 10 (block) which appeared longer compared to previous exam with difference attributed to improved tooling an lighting. VT-1 and EVT-1 of aligner pin assembly at 180° confirmed nine (9) previously identified flaws. All flaws showed no changes, except for Flaws 2 and 3 on keeper which appear longer compared to previous exam with difference attributed to improved tooling and lighting. One (1) new flaw was reported on the block to slider weld that was later confirmed to be present in the previous exam. Change attributed to improved tooling and lighting. VT-1 and EVT-1 of aligner pin assembly at 270° confirmed five (5) previously identified flaws that showed no changes. One (1) new flaw reported on keeper to washer weld that was later confirmed to be present in the previous exam.
Core Plate (Rim, etc.)	Fall 1995	VT-3	VT-3 examinations of Hold down bolts examined in 1995 per SIL 588. No indications.
	Spring 2000 (RE19)	VT -3*	VT-3 examinations of 48 bolts examined from top side. *(Bolts are not accessible for EVT-1)

	Fall 2001 to Fall 2009 (RE20 – RE26)	VT-3	VT-3 examinations performed on accessible areas per B-N-2. No indications.
	Fall 2012 (RE27)	VT-3	VT-3 examination of three (3) hold down bolt locations (70, 71, and 72) from the top side. No indications.
	Fall 2014 (RE28)	VT-3	VT-3 exam of 36 (50%) hold down bolt locations from the top side. No indications.
SLC	1986-2001	VT-2	VT-2 examinations of SLC penetration during Class 1 RPV pressure test each outage.
	Spring 2003 (RE23)	EVT-2	Enhanced VT-2 examinations during Class 1 pressure test. No indications.
	Spring 2005 (RE22)	EVT-2/UT	Enhanced VT-2 performed of safe-end and penetration in conjunction with ASME Section XI Class I pressure test. Manual UT to Appendix VIII performed on nozzle to safe-end weld. No indications.
	Fall 2006 (R23)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2008 (RE24)	EVT-2	Enhanced VT-2 examinations performed of safe-end and penetration in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2009 (RE25)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2011 (RE26)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.

	Fall 2012 (RE27)	UT	UT examination of N10 SLC nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2014 (RE28)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
Jet Pump Assembly	1986-1995	VT-1/VT-3 /UT	VT examinations on ten (10) Jet Pumps each outage. Exam includes applicable GE SILS. Jet pump beams replaced in 1985. Jet pump beam UT first performed in 1993.
	Spring 1997 (RE17)	VT-1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Examinations deferred to Fall 2001.
	Fall 2001 (RE20)	VT-3	VT-3 examinations on all 20 jet pump nozzle inlets per SIL 465. No indications.
		VT-1	VT-1 examinations on all WD-1's. No indications.
		EVT-1	EVT-1 examinations on BB-1 and BB-2 on JP's 1-10. EVT-1 on MX-2's on JP's 1 – 10. EVT-1 on RB-1's and RB-2's on JP's 1/2, 3/4, and 5/6. No indications. EVT-1 on RS-1's, RS-2's, and RS-3's on JP's 1 – 10. EVT-1 on RS-6's on JP's 1, 3, and 5. EVT-1 on RS-7's on JP's 2, 4, and 6. EVT-1 on RS-8's and RS-9's on JP's 1/2, 3/4, and 5/6. No indications.
	Spring 2003 (RE21)	VT-3	VT-3 examinations on the JP nozzle inlet mixers on JP's 11 - 20 per SIL 465. VT-3 examinations of set screws, gaps, and tack

			welds on JP's 1 – 20 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on the IN-4 on JP's 5, 6, 11, 12, 13, and 14. EVT-1 examinations on the MX-2 on JP's 11, 12, 13, and 14. EVT-1 examinations on the RB-1's and RB-2's, on JP's 11/12 and 13/14. EVT-1 examinations on RS-1 and RS-2 on JP's 11/12, 13/14, 15/16, and 17/18; RS-6 on JP's 11 and 13; RS-7's on JP's 12 and 14; RS-8's and RS-9's on JP's 11/12, 13/14. No indications.
		UT	UT examinations on the BB-1's and BB-2's for JP's 1 – 20. No indications.
	Spring 2005 (RE22	VT-3	VT-3 on the JP nozzle inlet mixers on JP s 1 – 10 per SIL 465. No indications.
		VT-1	VT-1 examinations on JP set screws, gaps and tack welds on JP's 1, 2, 15, and 16 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on RS-1, RS-2, and RS-3 welds on JP's 1 and 2 and the IN-4 welds on JP's 7, 8, 9, and 10. No indications.
	Fall 2006 (RE23)	VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 9, 10. VT-1 of WD-1 at JP's 9, 10. No indications.
		EVT-1	EVT-1 of RS-1 and RS-2 on JP's 15/16 and 19/20.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of IN-4's at JP's 19 and 20. EVT-1 examinations of RB-1a's, -1b's, -1c's, and -1d's between JP's 9/10 and 19/20. EVT-1 examinations of RB-2a's, -2b's, -2c's, and -2d's between JP's 9/10 and 19/20. EVT-1 examination of RS-3 between JP's 19/20. EVT-1 examinations of RS-6 at JP's 9 and 19. EVT-1 examination of RS-7 at JP's 10 and 20. EVT-1 examinations of RS-8 and RS-9 at JP's 19/20 and 9/10. No indications.

		UT	UT of BB-1, -2 and -3 on all 20 JP beams. No indications. UT of MX-2 (and AD-1, AD-2, DF-1, DF-2, DF-3 note in Diffuser Section) on all 20 jet pumps.
	Fall 2009 (RE25)	VT-3	VT-3 of JP nozzle inlets per SIL465 on JP's 15, 16, 17 and 18. No indications.
		VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 10. 15, 16, 19, and 20. VT-1 of WD-1 at JP's 17, and 18. No indications.
		EVT-1	EVT-1 examinations of IN-4 on JP's 15, 16, 17, and 18. EVT-1examinations of RB-1's and RB-2's on JP's 7/8, 15/16, and 17/18. EVT-1 examinations on RS-1's and RS-2's on JP's 11/12 and 17/18. EVT-1examinations on RS-3's on JP's 11/12, 15/16, and 17/18. EVT-1 examinations on RS-6's on JP's 7, 15, and 17 and RS-7's on JP's 8, 16, and 18. EVT-1 examinations on RS-8's and RS-9's on JP's 7/8, 15/16, and 17/18. No indications.
	Spring 2011 (RE26)	VT-3	VT-3 of JP nozzle inlets on JP 9 and 10. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed.
		EVT-1	EVT-1 of RS-8 and RS-9 on JP-1 thru JP-14, JP-19, and JP-20. No indications. EVT-1 of JP-9 and JP-10's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-3, RS-1, RS-2. EVT-1 of JP-9's RS-6 and JP-10's RS-7. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of JP-13 and JP-14's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, & RS-3.

			EVT-1 of RS-6 on JP-13 and RS-7 on JP-14. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications. EVT-1 of JP-15 and 16's RS-3. No Indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1, 2, 9, 10, 13, 14, 15, 16, 19, & 20. No indications of movement or wear observed. VT-1 of the JP-15 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of 0.003" with no signs of movement. Vessel side set screw confirmed to have partial contact. No indications on slip joint. VT-1 of the JP-20 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of .004" with no signs of movement. Newly reported Vessel side set screw gap measured to be .013". No indications on slip joint.
		VT-3	VT-3 of JP nozzle inlets on JP-13 and 14. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of MX-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 of JP-1 and JP-2's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6 on JP-1 and RS-7 on JP-2. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed. VT-1 of the set screws and auxiliary wedges on Jet Pump 1, 2, 9, &10. JP10 had a previously identified shroud side gap that was found to be 0.011" with no

			signs of movement. JPs 1, 2, and 9 set screws and aux wedges were found to be in full contact with no signs of wear.
		VT-3	VT-3 of JP nozzle inlets on JP-1 and 2. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of MX-2 and IN-4 on JP-6. No Indications.
			EVT-1 of RS-1, RS-2, and RS-3 on JP-3&JP-4 and RS-1 and RS-2 on JP-7&JP-8. No Indications
			EVT-1 of JP-5&JP-6's RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, and RS-9. No Indications.
		VT-1	VT-1 of set screw gaps and slip joints on JP-15 and JP-20. No Indications.
			VT-1 of the JP Restrainer Wedge (WD-1) at JP-5 and JP-6. No indications.
		VT-3	VT-3 of JP nozzle inlets on JP-6. No indications.
Jet Pump Diffuser	1986-1998	VT -3	10 Jet Pumps VT-3 examined each outage. No indications. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT-1/VT-3	VT examinations on ten (10) jet pumps. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Exams deferred to Fall 2001.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on ten (10) jet pumps (5 assemblies). Identified an indication thought to be a broken jet pump sensing line upper bracket retaining weld. Evaluated as acceptable.

	Spring 2003 (RE21)	VT-3	VT-3 on JP sensing lines for all jet pumps per SIL 420. No indications.
		VT-1	VT-1 on sensing line brackets for all jet pumps per SIL 420. Previously reported cracked bracket weld was determined not to be cracked. No indications.
		EVT-1	EVT-1 examinations of AD-1, AD-2, AD-3a, AD-3b welds on JP's 11 through 20. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 on JP sensing lines for JP's 1 – 11 and 14 per SIL 420. No indications.
		VT-1	VT-1 on JP sensing line brackets for JP's 1- 11 and 14. No indications.
	Fall 2006 (RE23)	EVT-1	EVT- 1 on AD-1 on JP's 1, 2, and 5. EVT-1 examinations on AD-2, AD-3a, AD-3b, DF-1 on JP-15, 16, 17, 18, 19, and 20 and DF-2 on JP's 15, 16, 19, and 20. No indications.
	Spring 2008 (RE24)	UT	UT on AD-1, AD-2, DF-1, DF-2, and DF-3 (and MX-2). One (1) indication on DF-1 at JP-14.
		EVT-1	EVT-1 examinations on DF-1 at JP-14 in addition to UT. Appeared to be a defect from original construction.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of indication to DF-1 on JP-14 identified during the previous outage. No change.
	Spring 2011 (RE26)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication was found to have no changes.
	Fall 2012 (RE27)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication did not change.
	Fall 2014 (RE28)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-1, DF-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 re-examination of indication located on the inside surface of

			JP-14 at the DF-1 weld. Indication did not change.
	Fall 2016 (RE29)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-2 on Jet Pumps 3, 4, 5, 6, & 7. No indications. EVT-1 of DF-1 (outside diameter) on Jet Pumps 6 and 14. No Indications. EVT-1 of DF-1 (inside diameter) for re-examination of indication on the inside surface of JP-14. Indication showed no change.
CRD Guide Tube	Fall 1995	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 1997 (RE17)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Fall 1998 (RE18)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of eighteen (18) anti-rotation pins and eleven (11) CRGT-1 welds. No indications.
		EVT-1	EVT-1 examinations of four (4) CRGT-2 and CRGT-3 welds. No indications.
	Fall 2001 (RE20)	VT-3	VT-3 examinations of thirteen (13) anti-rotation pins and thirteen (13) CRGT-1 welds. No indications.
		EVT -1	EVT-1 examinations of five (5) CRGT-2 and CRGT-3 welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations on one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations of one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of two (2) CRGT-2 welds and three (3) CRGT-3welds. No indications.
		EVT-1	

	Fall 2009 (RE25)		EVT-1 examinations on one (1) CRGT-2 weld and two (2) CRGT-3welds. No indications.
CRD Stub Tube	N/A	N/A	No record of examination.
In-core Housing	NA	NA	No record of examination back to 1996
Dry Tube	1989-1991	VT	VT exam in 1989, 1990, and 1991 per SIL409R1. All dry tubes replaced in 1993.
	Spring 2005 (RE22)	VT	Replaced one (1) dry tube.
	Fall 2012 (RE27)	VT-1	VT-1 was performed on dry tube locations at 12-09 and 28-25. No indications.
	Fall 2014 (RE28)	VT-1	VT-1 performed on IRM dry tube locations at 20-25 and 36-41. No indication observed. Replaced IRM dry tube at 12-41.
	Fall 2016 (RE29)	VT-1	VT-1 on Dry Tube Locations. IRM 28-33 & 36-09 and SRM 12-33, 20-17, & 36-25. No Indications.
Instrument Penetrations	1986-2000	VT-2	VT-2 examination performed during RPV system leakage test each outage for all six (6) instrument nozzle penetrations. No indications.
	Spring 2000 (RE19)	PT	PT examination of N16A instrument penetration nozzle to safe-end weld.
	Fall 2001 (RE20)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2003 (RE21)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2005 (RE22)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
		UT	UT examination of N16 nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
	Fall 2006 (RE23)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.

	Spring 2008 (RE24)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2009 (RE25)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2011 (RE26)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2012 (RE27)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2014 (RE28)	UT	UT examination of N16B nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2016 (RE29)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
Vessel ID Brackets	1986-1995	VT -1/VT-3	ASME XI VT-3 (non-beltline) and VT-1 (beltline examinations) of jet pump riser brace, dryer, FW Sparger, Core Spray, guide rod, and surveillance capsule holder brackets performed once per interval. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
		EVT-1	EVT-1 examinations on four (4) CS bracket attachment welds. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of guide rod attachment welds. No indications.
		VT-1	VT-1 on FW sparger brackets. No indications.

		EVT-1	EVT-1 examinations on CS bracket attachment welds. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on all FW sparger bracket attachment welds and all dryer support attachment welds. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examination of on JP riser brace pad attachment weld at 150°. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 examination of steam dryer hold down brackets.
	Fall 2006 (RE23)	EVT-1	EVT-1 of eight (8) FW sparger brackets and four (4) CS piping bracket attachment welds. No indications.
	Spring 2008 (RE24)	VT-3	VT-3 of guide rod attachment welds. No indications.
		EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 30°, 150°, 210°, 270°, and 330°. EVT-1 examinations of steam dryer support bracket attachment welds at 215° and 325°. No indications.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 60°, 90°, and 120°. No indications.
	Spring 2011 (RE26)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 30°. No Indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of four (4) CS piping bracket attachment welds at 30°, 150°, 210°, and 330°. No indications. EVT-1/VT-1 of JP riser brace pad attachment welds at 270°. No indications. EVT-1/VT-3 of steam dryer support bracket attachment welds at 215° and 325°. No indications.

		VT-1	VT-1 of surveillance capsule holder brackets at 300°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of Riser Brace attachment welds on JP-1 & 2 at 150°. No indications.
		EVT-1/ VT-3	EVT-1/VT-3 of steam dryer support bracket attachment welds at 145° and 35°. No indications.
		VT-1	VT-1 of surveillance capsule holder brackets at 30° & 120°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 90°. No Indications.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	Fall 2001 (RE20)	VT-1	VT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2003 (RE21)	EVT-1	EVT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2005 (RE22)	VT-1	VT-1 of leveling screws per OE 16110
	Fall 2006 (RE23)	VT-1 w/Character Card	Performed baseline VT-1 examinations to BWRVIP-139 and SIL 644, Rev 2. Re-examined five (5) minor indications previously identified per SIL 474 adjacent to several drain channels. Two (2) new indications were observed in a weld adjacent to a drain channel and both tack welds on one (1) lifting lug were observed. The indications were evaluated as acceptable.
	Fall 2009 (RE25)	VT-1 (89)	VT-1 examinations on seven (7) previously identified indications on dryer. With additional cleaning, six (6) of the

			indications disappeared with only one (1) remaining (i.e., the cracked tack welds on one (1) lifting lug - no change in the lifting lug).
	Fall 2016 (RE29)	VT-1 (89)	Performed VT-1 examinations to BWRVIP-139-A. Re-examined one (1) previous indication of cracked tack welds on lifting lug @ 145° with no changes. The other three (3) lifting lugs were observed to have similar cracked tacks that were not previously reported. Five (5) Tie Rods were reported to be slightly bent with no broken welds. One (1) additional indication was observed on the lower guide bracket weld at 180° that extended into the skirt. The indication was arrested with a 5/8th inch Stop-drill hole. No other dryer indications reported.
Dissimilar metal welds	Spring 2008 (RE24)	UT	Automated UT performed on four (4) CAT A welds per Appendix VIII. Manual UT performed on two (2) CAT A welds. All welds included in Risk-Informed ISI Program. No indications.
	Spring 2011 (RE26)	UT	Manual UT inspection performed on one (1) CAT D nozzle to cap weld (CRD Return) per Appendix VIII and Risk-Informed ISI Program. No indications.
	Fall 2014 (RE28)	UT	Manual UT inspection performed on three (3). CAT A welds per Appendix VIII. All welds included in Risk-Informed ISI Program. No indications.
	Fall 2016 (RE29)	UT	Automated Phased Array UT performed on one (1) CAT D weld and manual UT performed on one (1) CAT A weld. Both welds included in Risk-Informed ISI Program. No indications.

Reactor Internals Inspection History

Plant: **Dresden 3**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Spray Piping	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of piping and welds in annulus. Indications observed at two lower elbow to pipe welds 2P4c and 4P4c. These welds were repaired using GE designed clamps.
	4/97-R14	UT/EVT-1	UT Baseline inspections per BWRVIP-18 of all piping circ welds in annulus. Repairs removed and not reinstalled. EVT-1 of any piping welds in annulus inaccessible to scanner. Additional flaws identified on 1, 2 and 3P8a welds.
	2/99-R15	EVT-1	EVT-1 examined undemonstrated welds P8a and P4d on all four downcomers. Installed a "bumper" repair on 1P8a at the 80° downcomer.
	9/00-R16	UT/EVT-1	UT of "Target" welds and EVT-1 of all undemonstrated welds. Also EVT-1 of welds made inaccessible from repair installed on the 80° downcomer including 1P7, 1P4c, 1P4d, 1P8a and b. Welds 2P4c and 4P4c exhibited flaw growth as predicted by Flaw Evaluation.
	10/02-R17	VT-1	Six P4 welds for presence of "excessive grinding". NRI. All undemonstrated welds P8a and P4d and long seams on thermal collars, NRI
	10/04 – R18	EVT-1	Examined piping welds 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b. Eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		NA	Performed Core Spray Lower Sectional Replacement (all four downcomers) eliminating welds 1-4P4c, 1-4P4d, 1-4P8a, 1-4P8b, 1-4P5, 1-4P6, and 1-4P7.
	11/06 – R19	VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of all accessible bolting, keepers, ratchets and latch springs. NRI - VT-3 of all repair hardware. NRI

		EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
	11/08 – R20	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 4P4a, 4P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI
	11/10 – R21	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI.
		VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of 4 bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/12 – R22	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 1P4a, 1P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. One RI due to partially cracked tack weld.
	11/14 – R23	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for two piping brackets. RIs on both brackets due to partially cracked tack welds.
		VT-1/VT-3	Core Spray Lower Sectional Replacements (all four lines) - VT-1 of bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/16 – R24	EVT-1	Examined piping welds: 1P1, 2P1, 2P2, 2P3, 3P3, 4P4a, 4P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for three piping brackets. RIs on two brackets due to partially cracked tack welds.

Core Spray Sparger	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of spargers and tee-boxes. NRI.
	4/97-R14	EVT-1, VT-3	Examined tee-box cover plate welds (S1), tee-box to sparger arms (S2), and sparger end caps (S4) to EVT-1. NRI. Examined sparger nozzles (S3) and the sparger piping to VT-3. NRI.
	10/00 - R16	EVT-1, VT-3	Per BWRVIP-18: EVT-1 of all S1, S2 and S4. VT-1 of 50% of S3. NRI.
	10/04 – R18	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			-All 12 sparger brackets and bracket to shroud welds. NRI. -Core Spray Lower Sectional Replacement (all four downcomers) eliminating inspection of the following welds: 1-4S1, 1-4S2a-b.
	11/08 – R20	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 1S3 (007-080°), 1S3 (080-183°), 2S3 (007-110°), 2S3 (110-183°). NRI.
			All 12 sparger brackets and bracket to shroud welds. One relevant indication identified. Indication acceptable for one cycle of operation.
	11/10 – R21	VT-1	One sparger bracket to shroud weld which had a previous indication identified in R20. No identified change. Indication acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			All 12 sparger brackets and bracket to shroud welds. No change observed on previously identified relevant indication.
	11/14 – R23	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.

	11/16 – R24	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.
Attachment Welds	4/94-R13	VT-1	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. NRI.
	10/00-R16	VT-1	ASME Section XI B-N-2, surveillance capsule holder attachments in beltline. All six sets examined. NRI.
	10/02 - R17	EVT-1	BWRVIP-48 attachments: four dryer lugs, eight feedwater sparger end-brackets, eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI
	10/04 – R18	EVT-1	Four steam dryer wall support lugs, lug to pad, and pad to vessel attachment welds. Eight feedwater sparger lug to vessel attachment welds. NRI.
		VT-1	Eight feedwater sparger end-bracket lug assemblies. NRI
	11/06 – R19	VT-3	Examined attachment welds for two Core Spray piping brackets and all four steam dryer wall support lugs in accordance with ASME Section XI. NRI
		EVT-1	Inspected piping bracket to piping weld and bracket to vessel attachment weld on 2 core spray piping brackets. NRI
	11/08 – R20	EVT-1 and VT-3	- Examined attachment welds for two Core Spray piping brackets. NRI - Examined surveillance capsule holder bracket attachment welds. NRI
		VT-3	Examined steam dryer and steam separator guide rod attachment welds. NRI
	11/10 – R21	EVT-1	Examined attachment welds for two Core Spray piping brackets and two steam dryer wall support lugs. NRI
	11/12 – R22	EVT-1	Examined attachment welds for all 8 feedwater sparger end bracket attachment welds. NRI
	11/14 – R23	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI
	11/16 – R24	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI

Core Shroud	4/94-R13	EVT-1 and UT	Inspections per SIL 572, extensive indications in circumferential welds.
	4/97-R14	EVT-1 and UT	Inspected all shroud repair design reliant structure prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspections consisted of EVT-1 of all ring segment welds (accessible surfaces), UT for minimum ligament of all vertical welds accessible to scanner and EVT-1 for minimum ligament on all accessible surfaces of all vertical welds not accessible to the scanner.
		NA	Installed four tie-rod shroud repair assemblies and four core plate wedges.
	2/99-R15	VT-1	Examined all four tie-rod assemblies and core plate wedges at locations specified by the manufacturer (GE).
	10/00-R16	UT	Examined a 40° segment of H4 to assist in shroud qualification of Core Spray Repair. NRI.
	10/04 – R18	EVT-1	Examined Ring Segment Welds V1-V4 (Shroud Head RSWs), V8-V13 (Top Guide RSWs), and V20-V25 (Core Plate Support RSWs). Historical indications at V23 and V25 revealed no apparent change since last inspection in R14 (indications are not in HAZ. All other RSWs NRI.
	11/06 – R19	UT	GE utilized the Telescoping Shroud Scanner to perform UT on Shroud vertical welds V5-V6, V14-V19, V26-V28. Coverage obtained as follows: V5 – 80.4% V6 – 34.8% V14 – 66.8% V15 – 75.6% V16 – 80.4% V17 – 77.9% V18 – 95.5% V19 – 69.8% V26 – 13.7% V27 – 69.4% V28 – 57.6% One indication identified on V27 (1.8" in length). Indication acceptable for continued operation in accordance with BWRVIP-76.

		EVT-1	Performed one-sided EVT-1 examinations on vertical welds. NRI. Coverage as follows: V7 – 40% V29 – 40% (between H7 and H8 welds) V30 – 0% (between H7 and H8 welds) V31 – 30% (between H7 and H8 welds) V32 – 0% (between H7 and H8 welds)
		VT-3, EVT-1	Performed GE recommended inspections of shroud repair hardware. Scope included inspections to address susceptible areas based on indications found at Hatch. One RI identified due to retainer clip not engage. This retainer clip is redundant and did not require repair.
	11/08 – R20	EVT-1	Examined historical indications at V23 and V25. No apparent change from previous inspection.
	11/10 – R21	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V1, V2, V3, V4, V8, V9, V10, V11, V12, V13, V20, V21, V22, and V24. Horizontal indications were identified in the top guide ring below H2, near V12 and V13. Indications acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V7, V29, V30, V31 and V32. Inspected previous indications V12, V13, V23 and V25. Indications evaluated as acceptable.
		EVT-1&VT-1	Inspected shroud repair hardware and core plate wedges at all four azimuths. RI-minor wear noted.
	11/14 – R23	EVT-1	- Inspected previous indications V12 and V13 with no change observed. - Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
	11/16 – R24	UT	Inspected shroud vertical welds V5-V6, V14-V19, V26-V28. One indication identified on V27 (1.8" in length). Indication acceptable in accordance with BWRVIP-76.
		EVT-1	- Inspected vertical ring welds V1-V4, V8-V13 and V20-V25. Indications noted on V12, V13, V21, V22, V23 and V25. Indications evaluated as acceptable. - Inspected shroud vertical weld V7. NRI

		VT-3	- Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
Shroud Support	4/94-R13	UT/VT-1	Access hole cover VT/UT for circ and radial flaws. NRI.
	4/97-R14	EVT-1	Examined H8 and H9 for about 12" at 4 locations of shroud repair hardware attachment areas. NRI.
	2/99-R15	EVT-1	Per BWRVIP-38: Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI. Requirements for this inspection cycle are satisfied. NRI.
	10/02- R17	EVT-1	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	10/04 – R18	EVT-1	Examined H8 and H9 between Jet Pumps 10 and 11 (132°-177°). NRI
	11/06 – R19	EVT-1, VT-3	VT-3 of accessible areas of H9 and EVT-1 of 10% of H9 (between Jet Pumps 10 and 11). NRI.
	11/08 – R20	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI.
	11/10 – R21	UT	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	11/12 – R22	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°) and Jet Pumps 10 and 11 (132°-177°). NRI.
SLC	10/02 - R17	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/06 – R19	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/10 – R21	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/14 – R23	UT	UT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
Jet Pump Assembly	4/94-R13	VT-1	Hold down beams, beam bolt keepers, lockplates 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. Prior to R13, visually inspect 100% of upper areas of each Jet Pump including beam retainers every other outage.

	4/94-R13	VT-1	Riser brace arm to yoke welds on three upper (secondary) riser braces found cracked. Repairs are not required. No other reportable indications.
			Diffuser to baffle plate welds on all twenty jet pumps. NRI.
	4/97-R14	EVT-1	All ten RS-1, 2, 3, 4 and RS-5. NRI.
	2/99-R15	EVT-1	Initiate BWRVIP-41: Medium Priority: 50% of DF-1, MX-1, MX-3 and IN-5 welds. All twenty RB-1, 2, RS-8 and RS-9. NRI. High Priority: 50% of DF-2, AD-1, 2 and 3. NRI.
		VT-1	Examined all twenty WD-1 locations. NRI.
	10/02-R17	EVT-1	Repeat examination of four DF-2 welds to improve coverage. NRI.
			Five RS-9 and 10 riser to secondary brace yoke welds, NRI. Eleven secondary brace RB-3 welds per ASME XI and BWRVIP-48. NRI.
	03/03-D3M09	VT-1	Verified acceptable restrainer set-screw gaps when replaced beams (reference Jet Pump Beams section of this report). Aux wedges installed two set-screw locations. The other locations were NRI.
	10/04 – R18	VT-1	Examined jet pump sensing line clamps on jet pumps 1, 2, 3, 10, 11, 12, 13, & 20.
		EVT-1	Examined all twenty WD-1 locations. Noted normal movement of wedges 11 & 20 with no abnormal wear. All other wedges NRI.
			Examined AS-1 (set-screw gaps) on five jet pumps: 8 (Vessel Side, Shroud Side), 9 (VS, SS), 11 (SS), 12 (VS, SS), 20 (VS, SS). No unacceptable gaps were identified (all less than 0.010").

			Examined AS-2 (set-screw tack welds) on five jet pumps: 8 (VS, SS), 9 (VS,SS), 11 (SS), 12 (VS, SS), 20 (VS,SS). Lack of fusion of tack welds was identified on jet pumps and set screws: 9 (VS), 11 (SS), & 13 (VS). Indications noted on the tack welds for 9 and 13 were accepted as-is for one-cycle. Jet pump 11 had a set screw missing from its housing. The set-screw was retrieved and an auxiliary wedge was installed. Also discovered during the inspection of jet pump 11 was a poor quality tack weld on the swing-gate keeper. The condition of the bolt keeper was accepted for one cycle.
			The auxiliary wedge installed during D3M09 on jet pump 13 was examined and historical cracking was re-identified on the set-screw mounting block. This indication is historical and was caused by the ejection of the inlet-mixer following the failure of a beam-bolt. The indication has been accepted as-is. Also discovered on jet pump 13 was a gap between the vessel side restrainer bracket and the swing gate. The condition of the bracket and swing gate was accepted for one cycle.
			Examined RS-10 & -11 on jet pumps: 2, 3, 4, 12, & 13. NRI. Examined RS-1, 2, & 3 on five jet pump pairs: 1/2, 3/4, 9/10, 11/12, 13/14. NRI.
		UT	Examined MX-3a&b, DF-1, -2 & -3 and AD-1, -2 on jet pumps: 2, 3, 4, 5, 8, 9, 12, 13, 18, & 19. NRI.
	11/06 – R19	EVT-1	Examined RB-1 & 2 on jet pumps: 1, 2, 3, 4, & 20. NRI Examined RS-4 & 5 on jet pump pairs: 9/10, 11/12, 13/14. NRI Examined RS-8 & 9 on jet pump pairs: 1/2, 3/4, 5/6. NRI Examined MX-1 and IN-5 on jet pumps: 1, 2, 3, 4, 5, 11, 12, 13, 14, and 15. NRI
		VT-1	Examined aux wedge on JP 11. RI for slight wear on JP 11 aux wedge. Justified continued operation for one cycle. Examined main wedge WD-1 on JPs 1, 2, 3, 4, and 11 for wedge wear. NRI.

		NA	- Installed new ratchet style swing gate on JP 11 to address degraded keeper tack weld identified in R18. - Staked threads due to cracked tack welds (found in D3R18) and installed aux wedges on JP 9 vessel side and JP 13 vessel side set screws.
	11/08 – R20	EVT-1	Examined RB-3 on JPs 1, 2, 3, 4 and 5. NRI
		VT-1	- Examined aux wedges on JPs 9, 11 and 13. RI for slight wear on JPs 9 and 11 aux wedges. Justified continued operation for one cycle. - Examined AS-1 on JP 9 SS and JP 11 VS. NRI - Examined main wedge WD-1 on JPs 1, 2, 7, 8, 9, 11, 12, 13, 14, 17, 18, 19 and 20 for wedge wear. One RI for a bent main wedge handle. Condition acceptable as-is. - Examined swing gate keeper tack welds on JPs 7, 8, 9, 10 and 20. NRI - Examined JPs 1 and 2 transition pieces and sensing lines to address operating trends. NRI - Examined JP 11 swing gate bolting and ratchets. Swing gate installed in D3R19. NRI
	11/10 – R21	EVT-1	- Examined AD-1, AD-2, AD-3a, AD-3b on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI - Examined MX-3a and DF-1 on jet pumps 1, 10, 11, 14 and 15. NRI. - Examined MX-3b and DF-2 on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI. - Examined RS-1, RS-2, and RS-3 on jet pumps risers 5-6, 7-8, 15-16, 17-18 and 19-20. NRI. - Examined RS-8, -9, -10, and -11 on all of the jet pumps. NRI. - Examined RB-1 on jet pumps 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19. NRI.

		VT-1	- Replaced an aux wedge on JP 11. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined (secondary) riser brace arm to yoke welds on jet pump 19. RI with the condition acceptable as-is. - Examined swing gate latches and welded keepers on jet pumps 4, 5, 6, 15 and 16. NRI - Examined sensing line clamps on jet pumps 1 and 20. NRI - Examined main wedge WD-1 on JPs: 3, 4, 5, 6, 10, 15 and 16 for wedge wear. NRI
	11/12 – R22	EVT-1	- Examined RB-2 welds on jet pumps 9-12 & 19. NRI - Examined RS-4 & RS-5 on JP risers 1/2, 17/18 & 19/20. NRI - Examined RS-2 on JP risers 1/2, 3/4, 9/10, 11/12 & 13/14. NRI - Examined MX-1 welds on JPs 6-10. NRI - Examined RB-3 welds on 5 JPs. NRI - Examined JP-11 BB-2. NRI
		VT-1	- Examined RB-3 welds on all 20 JPs. NRI - Examined WD-1 on JPs 1, 2, 8, 11, 12 & 14. NRI - Examined swing gate keeper tack welds on JPs 1, 12, 13, 14 & 19. NRI - Examined Aux wedges on JPs 9 & 11. RI - Some wear was observed. - Examined vessel side AS-1 on JP 11. NRI
		VT-3	- Examined IN-5 bolting on JPs 6-10. NRI - Examined slip joint on JP 11. NRI
	11/14 – R23	VT-1	- Examined WD-1 on all jet pumps. RIs for wear on jet pump 9 and bent bail handles on jet pumps 17 and 20. - Examined swing gate keeper tack welds on four jet pumps and swing gate ratchets on one jet pump. NRI - Examined Aux wedges on JPs 9 & 11. RI - Wear was observed with both auxiliary wedges. - Examined vessel side AS-1 on JP 11 and shroud side AS-1 on JP 9. NRI

		VT-3	- Examined sensing line clamps on six jet pumps. RI on JP 12 due to gap between clamp and sensing line standoff bracket. - Examined jet pump 9 slip joint. NRI
	11/16 – R24	EVT-1	- Examined MX-3a and DF-1 on jet pumps 6, 7, 16, 17 and 20. NRI. - Examined MX-3b on jet pumps 9, 12, 13, 18 and 19. NRI. - Examined AD-1, AD-2, AD-3a and DF-2 on jet pumps 2, 3, 4, 5, 8, 9, 12, 13, 18 and 19. NRI. - Examined RS-1 and RS-3 on jet pumps risers 1-2, 3-4, 9-10, 11-12 and 13-14. NRI. - Examined RS-8 and -9 on jet pumps 11-12, 13-14 and 15-16. NRI. - Examined RS-10 and -11 on jet pumps 1-2, 11-12 and 15-16. NRI. - Examined RB-1 on jet pumps 1, 2, 3, 4 and 20. NRI. - Examined AS-1 on JP 9 shroud side and JP 11 vessel side set screws. NRI.
		VT-1	- Replaced aux wedge on JP 11 and installed slip joint clamps on jet pumps 11 and 12. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined aux wedge on JP 13. Minor wear noted. - Examined main wedge WD-1 on JPs: 4, 5, 7, 10, 11 and 19 for wedge wear. NRI - Examined main wedge WD-1 on JP 9. No change to previous wear.
		VT-3	- Examined sensing line clamp on JP 12. No change to previous indication.
Jet Pump Beams	4/94-R13	UT	Jet pump beams are UT examined each outage using technique capable of detecting cracking at throat and ears. Original group 1 beams.
	4/97-R14	UT	Examined all beams. Two beams with indications replaced. Balance NRI
	2/99-R15	UT	Examined all beams. NRI
	10/00-R16	UT	Two beams with indications replaced with group 2 style beams. Balance NRI.
	03/03-D3M09	NA	Replaced all 17 original beams with weld-less keeper Group 2 beams.

	10/04 – R18	VT-3	Examined 17 group 2 beam bolt retainer mechanisms (weld-less keeper) to ensure all keepers were engaged. NRI.
		EVT-1	Examined 3 group 2 welded keeper style beams. BB-1 and BB-2 on Jet Pumps 5, 8, and 13. NRI.
	11/06 – R19	NA	Pre-emptive replacement of aging beams on JPs 5, 8 and 13 rather than UT examine.
	11/08 – R20	VT-1	- Examined beam ratchet engagement on JPs 5, 8 and 13 after 1 cycle of operation. NRI - Examined beam and ratchet engagement on JPs 1 and 2 to address operating trends. NRI
	11/12 – R22	UT	Examined BB-1, BB-2 and BB-3 on 18 of 20 jet pump beams (Group 2). NRI
	11/14 – R23	UT	Examined BB-1, BB-2 and BB-3 on jet pump 11 beam (Group 2). NRI
		VT-1	Examined all 20 jet pump beam retainer clips. NRI
LPCI Couplings	NA		
Lower Plenum	4/97-R14	MVT-1	CRD Stub Tube, CRD H7. NRI.
	4/97-R14	MVT-1	ICH/RPV-1 and ICHGT/ICH-1, two inspected from cell H7. NRI.
	10/00-R16	EVT-1	Per BWRVIP-47: examined CRGT-1, 2 and 3 on D10. NRI.
	10/02-R17	EVT-1 and VT-3	Examined 9 CRGT-1, 2 and 3 and FS/GT-ARPIN. NRI. This completes first 5% in 6 years.
	10/04 – R18	VT-3	Bottom Head Drain cleaning project created access for the following examinations: - Examined eight Stub Tube to Vessel Welds (ST/RPV-1) and eight Stub Tube to CRD Housing Welds (CRDH/ST-1) in cells: F7, G6, G7, G8, H7, H8, H9, and J8. NRI. - Inspected two locations for Core Plate to Stiffener Plate Stitch welds: G7 & G8 beam welds. NRI. - Examined two locations for Stiffener Plate to Stiffener Rods welds: G7 and H8 beam tie rods. NRI.
	11/08 – R20	VT-3	Examined 9 CRGT-1 and FS/GT-ARPIN. NRI. This completes 10%.

		EVT-1	Examined 9 CRGT-2 and 3. NRI. This completes 10%.
	11/10 – R21	VT -3	Installation of a plug in the bottom head drain to support drain line valve maintenance created access for the following examinations from cells G7 and H8: - Examined accessible portions of eight Stub Tube to Vessel (ST/RPV-1) welds, eight Stub Tube to CRD Housing (CRDH/ST-1) welds and eight CRD Housing to Cap (CRDH-1) welds. NRI. - Examined accessible portions of four In-Core Monitor Housing to Vessel (ICH/RPV-1) welds, four In-Core Monitor Housing to In-Core Housing Guide Tube (ICHGT/ICH-1) welds, two In-Core Housing Support Hardware to In-Core Housing Guide Tube (ICHS/ICGT-1) tack welds and four In-Core Housing Support (ICHS-1) hardware tack welds. NRI.
Feedwater Spargers (Not in BWRVIP Scope)	11/06 – R19	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on four brackets. Justified operation for one cycle. Inspected sparger repair hardware from D2R18 isokinetic probe retrieval. NRI
	11/08 – R20	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on five brackets. Justified operation for one cycle.
	11/10 – R21	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. No apparent change in wear from R20.
	11/12 – R22	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R21. Performed inspections of spargers, arm welds and t-box welds. RI - Dent on one nozzle.
	11/14 – R23	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R22.

Steam Dryer	10/04 – R18	"Best Effort" VT-1	- Examined exterior surfaces including outer hoods, historical repair areas, tie bars and attachment welds, four lifting assemblies, four hold down assemblies, two man way covers, cover plates, fourteen gussets, upper ring welds, vertical guide welds, outlet plenum lower horizontal welds, outlet plenum vertical welds, and perforated plates. Multiple indications identified, including structural fatigue flaws in the outer hood areas. Outer hoods modified to repair cracking. - Examined interior surfaces including: drain channel welds, supports, vertical and horizontal plates, support ring, horizontal cross beams, and horizontal cross beam gussets. Initial start-up steam sample probe discovered missing. Probe located and retrieved from steam separator. Multiple non-structural indications also noted.
		VT-3	Examined interior and exterior skirt. Indications noted.
	11/06 – R19	"Best Effort" VT-1	Performed VT-1 inspection of outer hood welds on old dryer where previous indications had been identified and repaired. NRI.
		NA	Installed new dryer.
	11/08 – R20	"Best Effort" VT-1	Examined critical components on steam dryer after one cycle of operation per GE recommendations. One RI where dryer contacted steam separator guide rod (RI on guide rod also). Dryer and guide rod indications acceptable for one cycle of operation.
	11/10 – R21	"Best Effort" VT-1 and VT-3	Examined critical components on steam dryer. The RI from R20 where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change on both the SS guide rod and the SD.
	11/12 – R22	"Best Effort" VT-1 and VT-3	- Examined critical components on steam dryer. The previous RI where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change. - Examined dryer support lugs. Minor indications noted due to contact with the dryer.

	11/14 – R23	VT-1	- Examined the previous RI where the dryer contacted the steam separator guide rod with no change noted on dryer and guide rod. - Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
	11/16 – R24	VT-1	- Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
Top Guide	4/94-R13	VT-1	Examined beam intersections in five cells in response to industry experience. NRI.
	4/97-R14	VT-1	Per BWRVIP-26, baseline examined all four top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at the four aligner assembly locations. NRI.
	10/00-R16	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined rim weld 11. NRI.
	10/04 – R18	VT-1	Examined 90° and 180° top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at 90° and 180°. NRI.
	11/06 – R19	EVT-1	Examined rim weld from cell 03-34. NRI
	11/08 – R20	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined top guide rim weld. NRI
	11/12 – R22	EVT-1	- Top guide rim weld was inspected at accessible locations. NRI - Top guide grid beams were inspected from 10% of the cells (18 cells). NRI.
		VT-1	The aligner pins and sockets at all four locations. Indications identified at all four aligner blocks. Indications evaluated as acceptable for one cycle.
	11/14 – R23	VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. No change to previously identified indications.
	11/16 – R24	EVT-1	Top guide rim weld was inspected at accessible locations. NRI
		VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. New growth was observed on one of the previously identified indications.

Vessel	10/02 – R17	UT	Examined vertical welds SC1A, SC1C, SC2B, SC3A, SC3B, SC3C, SC3D, SC4A, SC4B, SC4C, and SC4D. NRI.
	10/04 – R18	UT	- Examined vertical welds SC1B, SC2A, SC2C, SC3A, and SC3B. NRI. Satisfies third interval Section XI inspection requirements. - Examined two original vessel construction base metal repair areas in beltline as required by Section XI. NRI.
		VT-3	Inspected cladding in accordance with ASME Section XI. NRI.
	11/06 – R19	VT-3	Inspected the reactor vessel cladding from the shroud flange to the reactor flange in accordance with ASME Section XI. NRI
	11/12 – R22	UT	Examined all 14 vertical welds, the flange to shell circumferential weld and two original vessel construction base metal repair areas in beltline as required by Section XI. All identified indications acceptable per Table IWB-3510-1.
		EVT-1	Examined weld and heat affected zones on four level instrument nozzles. NRI
Nuclear Instrument Dry-tubes (Not in BWRVIP Scope)	4/94 - R13	VT-1	Identified one cracked dry tube (24-37). Replaced. Examined every other outage to date. Per Reutter-Stokes recommendations, have not reached manufacturer's service life.
	11/06 – R19	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/08 – R20	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/10 – R21	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. RI identified movement on one IRM between the plunger and the Top Guide. Rub marks were also noted on the plunger. Acceptable as-is.
	11/12 – R22	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/14 – R23	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI
	11/16 – R24	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI

Steam Separator (Not in BWRVIP Scope)	10/04 – R18	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear that was evaluated as-is for continued operation. Examined eight standpipe to shroud head welds and eight gusset to ring welds, NRI.
	11/10 – R21	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation. Replaced two SHBs. One of the two was missing the pin and the other had excessive pin to window wear.
	11/12 – R22	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/14 – R23	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/16 – R24	VT-1	Examined pin and window condition on 2 shroud head bolts. No change to previous wear.
Piping Welds (BWRVIP-75-A)	11/08 – R20	UT	Performed manual UT on four (4) IGSCC Category C welds and two (2) IGSCC Category A welds. None of these welds were dissimilar metal (DM) welds. No relevant indications identified.
	11/10 – R21	UT	Performed manual UT on six (6) IGSCC Category D welds. Five of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/12 – R22	UT	Performed manual UT on seven (7) IGSCC Category D welds. Four of these welds were on the reactor head spray system and three were on the reactor head vent system. Four of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/14 – R23	UT	Performed manual UT on nine (9) IGSCC Category C welds. None of these welds were dissimilar metal (DM) welds. No relevant indications were identified.

	11/16 – R24	UT	Performed UT exams on six IGSCC Category D welds. Two were on the HPCI system and four on the ISCO system. All six of these welds were DM welds. Five of the welds had automated exams performed. No relevant indications were identified.
Cast Austenitic Stainless Steel	11/12 – R22	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/14 – R23	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/16 – R24	EVT-1	Inspected one fuel support piece and one control rod guide tube base. NRI

Reactor Internals Inspection History

Plant: **Duane Arnold Energy Center**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1995	UT	Performed ultrasonic examination of the accessible areas. Baseline per BWRVIP-01, no indication were detected.
	2001	UT	Performed ultrasonic examination of the H1-H7 welds, no indications found.
	2010	Phased Array UT	Unable to complete the ultrasonic examination of the accessible areas due to equipment issues. Performed OD EVT-1 inspections to supplement and submitted Deviation Disposition to do the UT exams in 2012. No indications found.
	2012	Phased Array UT	Indication on H1 weld, approx. 1" long and 1/8" deep, ID. All other welds no indications.
Access Hole Covers	2012	Phased Array UT	Performed ultrasonic examination of 0° and 180° AHC. Two indications found on each AHC up to 70% through wall and 30% around. Evaluated in accordance with BWRVIP-180.
Shroud Support	1988/1993	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	1998	VT-3	VT-3 of shroud support.
	1999	VT-3	Shroud Support including H-8/H-9 (360 degrees).
	2001	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	2003	VT-3	Shroud Support including H-8/H-9 (180 to 360 degrees).

	2005	VT-3	Shroud Support including H-8/H-9 (0 to 180 degrees).
	2007	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of 180° of the shroud plate including both access hole covers – no indications.
	2009	VT-3	Shroud Support including the H-8/H-9 (0 to 180 degrees) – no indications.
	2012	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of H8/H9 – no indications.
Core Spray Piping	96 (portion every RFO)	VT	Performed Visual Examination (EVT, CSVT, VT-3), baseline per BWRVIP-18, no indications were detected.
	1998	EVT-1	Reinspection per BWRVIP-18 – no indications.
	1999	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2001	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2003	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2005	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2007	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2009	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2010	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2012	EVT-1	Reinspection per BWRVIP-18 – no indications.

	2014	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2016	EVT-1	Reinspection per BWRVIP-18 – no indications
Core Spray Sparger	96 (portion every RFO)	VT	Performed Visual Examination (CSVT, VT-3), baseline per BWRVIP-18, no indications were detected. One sparger nozzle is inspected every other RFO due to a missing tack weld.
	1999	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2001	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2005	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2009	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2012	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2014	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
Top Guide (Rim, etc.)	1995	VT-1 (1/2 mil wire)	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. 100% inspection of the grid locations has been completed over the past three RFOs.
	1998	VT-3	VT-3 0° location.
	1999	VT-3	Examined nine cells (top general and bottom of grid areas).
	2001	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect the two hold down assemblies.

	2003	VT-3	Examined five cells (top general and bottom of grid areas).
	2005	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect two hold down assemblies.
	2005	VT-3	Examined four cells (top general and bottom of grid areas).
	2007	VT-1	Performed VT-1 examination of the bottom side of eight grid locations – no indications.
	2009	VT-1 VT-3	Performed VT-1 of the Latches at 46° and 226° location. VT-1 of the fillet welds on the contour wedges at 90° and 270°. Was not able to obtain 100% coverage of the fillet welds on the contour wedges due to the fuel being in the way. Will re-schedule in 2010. Performed VT-3 of the top guide – no indications.
	2010	VT-1 VT-3	Performed VT-1 of the Latches at 136° and 316° location. VT-1 of the fillet welds on all contour wedges. Performed VT-3 of the top guide – no relevant indications.
		EVT-1	Performed EVT-1 at Grid Locations 42-27, 42-23, 22-43, 22-03, 02-23, and 02-19 – no relevant indications.
	2014	VT-1	Performed VT-1 of the Latches at 226° location – no relevant indications. Performed VT-1 of the contour wedges and fillet welds at 90° and 270°. Was not able to obtain 100% coverage of the contour wedges and fillet welds due to the fuel bundle being in the way. Will re-schedule exams for 2016.
	2016	VT-1	Performed VT-1 of the contour wedges and fillet welds at 90° and 270° and verified that alignment blocks in place. Previous indications identified in 2010 have not changed. An additional shallow indication was found on a contour wedge

			and on an alignment block. Will schedule exams for 2018.
Core Plate (Rim, etc.)	1995	VT-3	Verified 25% core plate bolts were in place.
	1998	VT-3	Verified 20% core plate bolts.
	1999	VT-3	Examined Fuel support castings in nine cells, no indications.
	2001	VT-3	Verified rim hold down bolts 1-54 Examined Fuel support castings in ten cells, no indications.
	2003	VT-3	Examined Fuel support castings in five cells, no indications.
	2005	VT-3	Examined Fuel support castings in twenty cells, no indications.
	2007	VT-3	Performed a general VT-3 of Fuel Support Casting in eight locations – no indications.
	2009	VT-3	Performed a VT-3 examination of Fuel Support Castings in 12 locations – no indications.
	2012	VT-3	Performed VT-3 on 12 of 54 core plate bolts – no indications
	2014	VT-3	Performed VT-3 on 14 of 54 core plate bolts – no indications.
SLC	1993	PT	Liquid Penetrant examination of the nozzle-safeend weld.
	2001	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2003	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2005	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld.

	2007	UT	Performed Appendix VIII UT of the Nozzle-Safeend Weld – no indications.
	2016	UT	Performed Appendix VIII Automated Phased Array UT of the Nozzle-Safeend Weld – no indications.
Jet Pump Assembly	96 (sample every RFO)	VT-3	Inspection of the riser spt pads (SIL551), holddown beams (SIL330), sensing lines (SIL420), three point contact (RICSIL078). Will inspect Riser Elbow in 1998. Repair to the set screws have been completed.
	1998	MVT-1	50% of total number of jet pumps, 100% of each inspected – no indications. All hold down beams – no indications.
	1999	UT EVT-1	DF-1 on JPs 1, 2, 3, 4, 13, 14, 15, 16, IN-4, MX-2 and WD-1 on JPs 3, 4, 13, and 14, RB-1 and RB-2 on JPs 3, 4, 13 and 14. This completes all exams on 8 of 16 JPs.
	2001	EVT-1	RB-1, RB-2, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, on JPs 7 and 8. No indications.
	2003	EVT-1	RB-1, RB-2, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, and 10. RS-1, RS-2, RS-3, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, 10, 11, 12. DF-1 on JPs 5, 6, 7, 8, 9, and 10. No indications. All hold down beams - no indications.
	2007	UT	Performed UT of all 16 Jet Pump. Holddown beams using GE technique – no indications.

	2007	EVT-1	AD-1 on JPs 15,16 AD-2 on JPs 15, 16 DF-1 on JPs 11, 12, 15, 16 DF-2 on JPs 15, 16 IN-4 on JPs 11, 12, 15, 16 MX-2 on JPs 11, 12, 15, 16 RB-1 on JPs 1, 2, 11, 12, 15, 16 RB-2 on JPs 1, 2, 11, 12, 15, 16 Riser Brace Pad on JPs 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16 RS-1, RS-2, RS-3 @ 324° location RS-6 on JPs 11, 15 RS-7 on JPs 12, 16 RS-8, RS-9 @ 252°, 324° locations
		VT-1	WD-1 on all 16 JPs No indications noted from any of the visual examinations.
	2009	EVT-1	DF-2 on JPs 1, 2, 3, 4, 13, 14 AD-1 on JPs 1, 2, 3, 4, 13, 14 AD-2 on JPs 1, 2, 3, 4, 13, 14 RS-1, RS-2, RS-3, TS-1A @ 36°, 72°, 288°
		VT-3	Sensing Line Clamp on JPs 1, 2, 3, 14 Sensing Line Support on JPs 4, 5, 12, 13 Sensing Line Exits at 90° and 270° No indications noted from any of the visual examinations.
	2010	EVT-1	RB-1, RB-2 on JPs 5, 6, 7, 8 RS-6, RS-7 on JPs 5, 6, 7, 8 RS-8, RS-9 on all JPs IN-4, MX-2 on JPs 5, 6, 7, 8 DF-1, DF-2 on JPs 5, 6, 7, 8 AD-1, AD-2 on JPs 5, 6, 7, 8 RS-1, RS-2, RS-3, TS-1A @ 108°, 144°
		VT-3	Sensing Line Clamp on JPs 6, 7, 8 Sensing Line Support on JPs 6, 7, 8 No relevant indications, indications on sensing line clamps were determined to be the result of initial installation.
	2012	EVT-1	DF-1, DF-2 on JPs 13, 14, 15, 16 AD-1, AD-2 on JPs 13, 14, 15, 16 RS-1, RS-2, RS-3, TS-1A @ 288°, 324°

	2014	EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 3 (at 64°), and 4 (at 80°) - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JPs 9 (208°) and 10 (224°) – no relevant indications.
	2016	UT	Performed UT of all 16 Jet Pump. Holddown beams using WesDyne technique – no indications.
		EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 11 and 12 - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JP 11 and standoff on JP 12– no relevant indications.
CRD Guide Tube & Stub Tube	95 (every 10 years)	VT-3	Inspected accessible portions of three guide tubes and three stub tubes, no indication were detected.
	2003	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2005	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2007	VT-3	Performed general VT-3 examination of eight locations – no indications.
Dry Tube	88 (6 cycles and then every three cycles)	VT-1 (1 mil wire)	Inspected in 1988 with indications reported, replaced with the new design.
	1999	VT-3	Inspected accessible portions of 11 dry tubes, no indications noted.

	2007	VT-1	Performed VT-1 of upper 24" of five dry tubes. Note the exam was performed on the accessible areas – no indications.
	2009	VT-1 VT-3	Performed examination on four dry tubes. Note the exam was performed on the accessible areas – no indications.
	2010	VT-1	Performed examination on six dry tubes. Note the exam was performed on the accessible areas – no indications.
	2014	VT-1	Performed VT-1 on five (5) dry tubes. Note the exam was performed on the accessible areas – no indications.
	2016	VT-1	Performed VT-1 on two (2) dry tubes. Note the exam was performed on the accessible areas – no indications.
Instrument Penetration			
Vessel ID Brackets	Every 10 years	VT1(active fuel) VT-3 all others	Per ASME Section XI.
LPCI Coupling	N/A	N/A	Not applicable to DAEC.
Top Head	1998	VT-3	No indications.
	1999	VT-3	No indications.
	2003	VT-3	No indications.
	2005	VT-3	No indications.
	2007	VT-3	Performed VT-3 of interior portion of the RPV Head – no indications.
Guide Rod	1998	VT-3	No indications.
	1999	VT-3	Both examined (found cracked tack weld on 0 degree rod which was evaluated as acceptable).
	2001	VT-3	Inspected 0 degree guide rod, no additional indications.

	2003	VT-3	Inspected 180 degree guide rod, no indications.
	2007	VT-3	Inspected 180 degree guide rod, bracket, and bracket welds – no indications.
	2009	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
	2016	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
Sample Holder Integral Attachments	1998	VT-1 VT-3	No indications.
	1999	VT-1 VT-3	108 and 288 degree examined with no indications.
	2001	VT-1 VT-3	108 degree examined with no indications.
	2003	VT-1 VT-3	36 and 108 degree examined with no indications.
	2005	VT-1 VT-3	288 degree examined with no indications.
	2007	VT-3	108° location – no indications.
	2009	VT-3	288° location – no indications.
	2012	VT-3	All upper brackets – no indications.
	2014	VT-1	All lower brackets – no indications.
Core Spray Piping & Sparger Brackets	1998	VT-3	No indications.
	2001	VT-3	No indications.
	2005	VT-3	No indications.
	2009	EVT-1	Performed EVT-1 on the Piping Brackets at 30°, 150°, 210°, and 330° - no indications.

		VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2012	VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2014	VT-1	Performed VT-1 on the Sparger Bracket at 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2016	EVT-1 & VT-3	Performed EVT-1 on the Piping Bracket attachment welds and VT-3 of the attachment hardware at 30°, 150°, 210°, and 330° locations – no indications.
Jet Pump Riser Support Pad	1998	VT-1	No indications.
	2003	VT-1	216 degree pad – no indications.
	2005	VT-1	144 and 252 degree pads – no indications.
	2014	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 3 (at 64°), and 4 (at 80°) – no indications.
	2016	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 11 and 12 – no indications.
Feedwater Spargers	1998	VT-1 VT-3	Indications around flow holes.
	2001	VT-1 VT-3	No additional indications.
	2005	VT-1 VT-3	No additional indications.
	2007	VT-1	Detailed inspection of all four spargers at the following locations due to broken keeper: Vessel Attachment Keeper to pin Handle interface Keeper to Sparger Bracket weld Pin to sparger bracket Pin to wall bracket

			Sparger Bracket & Bolts Sparger Bracket to Vessel Measurement Sparger to End Plate Jacking Bolts (two spargers only) T-Box to Sparger Welds Wear was noted in several locations. (details can be provided if requested).
	2009	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications
		EVT-1/ VT-3	Performed EVT-1/VT-3 of Bracket Welds at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no indications Implemented a FW Sparger Modification to repair the indications noted in 2007. This modification was to re-install the preload on the spargers @ 225° and 315°.
		VT-1	Performed VT-1 on FW Brackets @ 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - wear was identified on the 264° 276°, and 354°.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2012	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.
		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2016	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.

		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
Steam Dryer	2003	VT-1/3	Inspect per GE SIL644. Indications in Upper Support Ring, Drain Channels, and Access Openings- all indications evaluated "use as is".
	2005	VT-1/3	Inspect per GE SIL644 Rev 1. Indications in Drain Channels and Upper Support Ring – all indications evaluated "use-as-is". No change in previous indications.
	2007	VT-1	Inspected per BWRVIP-139 (all exterior locations) Indications in Drain Channels, Access Openings and Upper Support Ring. All indications evaluated "use-as-is" for one cycle. Some of the previous indications could not be located and some new indication were identified. (Details can be provided if requested.)
	2009	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). All previously identified indications were noted as "No change". Three new indications were identified. 1) Upper Guide Bracket was observed to have a rolled piece of metal extending out and below the face/corner of the guide channel. 2) Middle weld on Tie Bar #4 was found cracked, and 3) Lower guide bracket, 180° side was found bent. All indications were determined to be acceptable.
	2010	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). Two previously identified indications were noted as NRI, all others were "No change". Three new indications were identified on access hole

			cover. All indications were determined to be acceptable. Repairs made to Tie bars 3, 4, and 7 and to the rolled metal on the upper guide found during previous outage.
	2012	N/A	No inspections
	2014	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
	2016	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
Dissimilar Metal Weld	2009	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on four (4) Category C, seven (7) Category D and two (2) Category E dissimilar metal welds.
	2010	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on ten (10) Category C, fifteen (15) Category D and two (2) Category E dissimilar metal welds. One category C weld had relevant indications. This was repaired by a weld overlay during the outage.
	2012	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on one (1) Category C dissimilar metal weld – no indications.
	2014	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on three (3) Category C and four (4) Category D dissimilar metal welds – no indications.

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.
	Fall 2016 RF20	UT	Examined 100% accessible regions of H-3, 4, 5, 7. Found 5 indications in H4, all less than 3 inches length, less than 17% thru wall, 1.93% of examined length. Found 1 indication in upper side H5, 5.96 inches in length, depth 15%, 1.39% of examined length. Examined portions of H4 and H7 for off-axis indications in accordance with VIP interim guidance. 2 minor indications identified on H4, both less than 2 inches in length, depth less than 15% thru wall. Re-inspection scheduled for 10 years in accordance with BWRVIP-76 and VIP interim guidance.
Shroud Support	Spring 1994 RF06	VT-3	Examined 6 shroud support pillars 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 RF16	VT-3	Examined annulus surface. No issues or FME found.
	Spring 2012 RF17	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	Examined annulus surface, FOSAR, recovered 5 Powerfect nuts.
		EVT-1	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.
	Spring 2015 RF19	EVT-1	Examined flat access hole cover. No indications.
		EVT-1	Examined top hat access hole cover. Examined 77.78% circumferentially of vertical weld, 24.2% has signs of indications.
	Fall 2016 RF20	VT-3	Examined annulus surface. No issues or FME found.
		VT-3	Examined annulus surface. No issues found. Identified FME removed from the vessel.
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	Examined all creviced and non-creviced weld locations, no indications

		VT-1	Examined all (8) header brackets, no new indications.
	Spring 1999 RF08	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no new indications.
	Spring 2000 RF09	EVT-1	Examined all creviced weld locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Fall 2001 RF10	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Spring 2003 RF11	EVT-1	Examined all creviced weld locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2004 RF12	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2006 RF13	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2007 RF14	UT & EVT-1	Examined all creviced and 100% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2009 RF15	EVT-1	Examined all locations that could not be UT examined in the previous outage, no indications.
		EVT-1 & VT-3	Examined 25% header brackets. No indications.
	Fall 2010 RF16	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.

	Spring 2012 RF17	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.
	Spring 2015 RF19	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
	Fall 2016 RF20	EVT-1 EVT-1 & VT-3	Examined 'B' loop piping elbows (P4a-d), 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 RF16	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 RF16	EVT-1	Examined 4 top guide grid beam locations. No indications.
	Spring 2012 RF17	EVT-1	Examined 2 top guide grid beam locations. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 top guide grid beam locations. No indications. SRM plunger tip was not fully seated but was reseated into the receptacle.
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	50% riser braces (RB-1/2 & RS-8/9), 100% RS-1, no indications

		VT-1	100% sensing lines. Three pumps have cracked standoffs, installed clamps.
		VT-3	100% beams, no indications
		VT-3	100% wedges and setscrews. 1 screw with 1 tack cracked
	Spring 1999 RF08	EVT-1	50% riser brace(RB-1/2 & RS-8/9), no indications
		EVT-1	100% RS-1, no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% beams, 100% wedges and setscrews, no indications
	Spring 2000 RF09	EVT-1	50% riser brace (RB-1/2 & RS-8/9), no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% wedges and setscrews, no indications
	Fall 2001 RF10	VT-1	100% sensing lines, no indications
		VT-3	100% wedges
	Spring 2003 RF11	VT-1	100% wedges, no movement noted
		EVT-1	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
		VT-1	50% sensing lines, no indications
	Fall 2004 RF12	UT	100% beams, BB1/2, no indications
		VT-1	50% sensing lines, no indications
		EVT-1	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	50% sensing lines, no indications
		VT-1	100% wedges, one had minor wedge wear, installed slip joint clamp
		EVT-1	25% RB-1/2, 25% RS-8/9, no indications
	Fall 2007 RF14	VT-1	100% wedges, one had minor wedge wear and SS setscrew gap of 35 mil, installed auxiliary wedge
		VT-1	1 slip joint clamp, no issues
		VT-1	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 VT-3 VT-1 VT-3 EVT-1	100% wedges, no wear found. Slip joint clamp and aux wedge. No issues found. 11 sensing lines. No indications. Installed aux wedge for an issue found previous outage. 50% RS3, no indications.
	Fall 2010 RF16	EVT-1 VT-1 VT-3	100% RS-8/9 and 25% RS-6/7. No indications 50% wedges. No new wear found. 3 sensing line clamps and 1 aux wedge. No issue found.
	Spring 2012 R17	EVT-1& VT-1 VT-1 EVT-1	25% inlet/mixer and diffuser welds (IN4, MX2, DF1/2, AD1/2). No issues found. 3 riser brace welds. No issues found. 50% wedges. No new wear found. 3 RS-1 and RS-2. No issues found.
	Fall 2013 RF18	UT VT-1 VT-1	100% beams, no indications 3 sensing line lower bracket, no indications 6 known setscrews tack cracks. 3 confirmed no growth, 3 no indication.
	Spring 2015 RF19	VT-1 VT-1 VT-3 VT-3 VT-3 EVT-1 EVT-1 & VT-1	50% wedges and rods. No new wear found. 14 sensing line support brackets. No indications. 3 sensing line clamps. No indications. 1 Slip joint clamp. No indications. 2 Aux wedges. No indications. 50% RS-3 Riser to Transition. No indications. 2 Riser Braces, RB-1 & RB-2. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 restrainer bracket to riser pipe welds, RS-6 and RS-7, and 3 riser brace to riser pipe welds, RS-8 and RS-9, no indications.

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 VT-3	Below Core Plate Inspection Examined 100% of CRGT-2 & CRGT-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	VT-1	Examined IAW SIL 409. No indications found.
	Spring 1999 RF08	EVT-1	All 12 dry tubes had circumferential cracking approx 1 inch below the upper collar
	Spring 2000 RF09		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	VT-1	50% jet pump riser bracket, no indications
	Fall 1997 RF07	VT-1 VT-3	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

	Spring 1999 RF08	VT-1	25% core spray header bracket, 100% feedwater sparger bracket, 100% steam dryer support bracket, no indications.
		EVT-1	50% jet pump riser bracket, no indications
		VT-3	100% guide rod bracket, no indications
	Spring 2000 RF09	VT-1	25% core spray header bracket, no indications
		EVT-1	50% jet pump riser bracket, no indications
	Fall 2001 RF10	VT-1	25% core spray header bracket, no indications
		VT-3	100% guide rods, no indications
	Spring 2003 RF11	EVT-1	25% core spray header bracket, no indications
	Fall 2004 RF12	EVT-1	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 RF16	EVT-1 VT-1	25% core spray header brackets. 2 Feedwater bracket pins where wear previously found. No discernable change.
	Spring 2012 RF17	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 VT-1 VT-3	25% core spray header brackets and 4 jet pump riser braces. No issues found. Examined 120deg surveillance capsule assembly.
	Spring 2015 RF19	EVT-1 & VT-1	2 jet pump riser brace arm. No indications.
		EVT-1 & VT-3	25% core spray header brackets.
		EVT-1 & VT-3	100% steam dryer support bracket to RPV. No indications.
		VT-3	2 guide rod flange & brackets. No indications.
		VT-3	100% feedwater sparger vessel attachments. No indications.
		VT-3	2 Feedwater bracket pins where wear previously found. No additional wear.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
LPCI Coupling	Fall 2001 RF10	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2003 RF11	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2006 RF13	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2012 RF17	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2015 RF19	EVT-1 VT-1 VT-3	Examined 50% couplings. Two indications on the shroud attachment ring, ~.88" & 1".

		EVT-1	Expanded scope to include same location on balance of couplings. No indications.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
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	100% drain channels, one indication identified on skirt below a seismic lug access plate weld, 0.75"
		VT-1	100% support ring, no new indications, no growth on previous indication
	Spring 2003 RF11	VT-1	100% support ring, no new indications, no growth on previous indication
		EVT-1	Re-look at skirt indication, no growth
		EVT-1	Manway cover plate
		VT-1	100% cover plates
		VT-3	100% tie bars
		VT-1	100% lifting lug braces, one found severed.
	Fall 2004 RF12	VT-1	100% support ring, no growth on previous indication, new indication identified; 0.625" across top, and 0.75" down face.
		VT-1	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	Previously identified indications on support ring, no growth found.
		VT-1	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 crater crack found on a lifting rod bracket weld. All indications were evaluated for use as is. No repairs required.
	Fall 2010 RF16	VT-1	2nd re-baseline IAW BWRVIP-139 following EPU 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 RF17	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.
	Spring 2015 RF19	EVT-1 & VT-3	100% Support bracket to RPV. No indications.
		VT-1	Examined known flaw for growth. No growth observed.
	Fall 2016 RF20	VT-1	Examined 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 RF16	UT	Examined 5 category C welds after weld crown reduction; 2 by auto, 3 by manual. No indications found.
	Spring 2012 RF17	UT	Examined 1 category E weld by manual UT.
	Fall 2013 RF18	A-UT	Examined 3 category C welds with automated UT. No growth of known embedded flaws, no new indications.
	Fall 2016 RF20	A-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)
	Spring 2015 RF19	VT-3	Examined eight shroud head bolts, including pin area. No indications.
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.
Capsule	Spring 1994 Spring 2015 RF19		Removed 30 degree capsule. Removed 120 degree capsule per EPRI ISP program.

Reactor Internals Inspection History

Plant: **Oyster Creek Generating Station**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Steam Dryer	Fall 2016	Visual	VT-1 of all high stress (red) locations and 10% of green locations. A total of 81 locations were inspected. EVT-1 of all 4 Hold Down Assemblies and all 4 Dryer Lifting Rods. Re-inspected previous Steam Dryer indications and repair areas. Evaluated indication areas with no change and areas with minor change as acceptable as is. New indications on tie bars TB-F measured 1.3" and TB-I ~ ¼". Indications on drain channels welds V07 ID &V15 ID and Jacking Bolt at 50 degrees are new or showing growth or changes from the previous examinations. These indications are acceptable until 2020 which is after plant shutdown.
	Fall 2014	Visual	Re-inspected 2 Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2012	Visual	Re-inspected Steam Dryer indications and repair areas, including indications on the ID, identified during previous outages. Evaluated indication areas with no change and areas with minor change to use-as-is for one cycle.
	Fall 2010	Visual	Re-inspected Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2008	Visual	Completed BWRVIP-139 required inspections of the ID of the dryer using GEH Firefly ROV. Identified 2 areas of fatigue cracking in drain channels and 1 area of fatigue cracking in support beam to mid-support ring weld.

			Evaluated as use-as-is for one cycle in accordance with BWRVIP-139 generic flaw evaluation. Re-inspected Steam Dryer indications and repair areas identified during previous outages. Tie bar N-1 lower repair area was found degraded and GEH issued JCO for one cycle of operation.
	Fall 2006	Visual	Re-inspect Steam Dryer Indications identified during previous outages. EVT-1 cracks in hold-down area from 1R19. VT-1 all 4 lifting lugs and EVT-1 indications on 135 deg. lug. BWRVIP-139 required inspections (top side) completed. New fatigue indications were identified that required repair. Dryer repair project completed with 2 areas stop drilled and one crack in center baffle plate was cut out.
Core Shroud	Fall 2016	VT-3	VT-3 of Tie-Rods at 10 deg and 70 deg. No findings Re-inspection of two horizontal indications on vertical weld V-9. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. No changes in the end points from 2006. These conditions are acceptable for ten years.
	Fall 2014	VT-3	VT-3 of 5 Tie-Rods at 100, 130, 160, 280 and 350 deg. locations. No findings.
	Fall 2012	VT-3	VT-3 of 3 Tie-Rods at 170, 220 and 310 deg. Locations. No findings.

	Fall 2010	VT-3	VT-3 of 2 Tie-Rods at 10 and 70 deg. Locations (#2 and #8). No findings.
	Fall 2008	UT / EVT-1	UT / EVT-1 inspection completed for all 10 shroud vertical welds. One indication found with UT in V10 weld – 1.76 inches long with depth of 0.47 inches. A technical evaluation was completed to use-as-is.
		VT-3	VT-3 Tie-Rods at 100 deg, 130 deg, 160 deg, 280 deg, and 350 deg. No findings.
	Fall 2006	EVT-1	V-9 inspection of ID and OD. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. A technical evaluation was completed to use-as-is. VT-3 Tie-Rods at 170 deg, 220 deg and 310 deg. No findings. VT-1 of Upper Bracket to Shroud Ledge interface on all 10 Tie Rods. No findings.
	Fall 2004	None	No Examinations Required.
	Fall 2002	None	No Examinations Required.
	Fall 2000	EVT-1	V-3, V-4, V-15 and V-16. This was a one sided exam from the OD. No findings.
	Fall 1998	UT EVT-1	V-7, V-8, V-10 and V-12. V-11 I.D. Seven tie-rod assemblies baseline inspected. V-10 exhibited minor OD cracking away from the heat-affected zone. This cracking is believed to be associated with handling lugs that were welded during construction and removed after installation. All other inspected vertical welds were found free of indications. With the inspections

			performed in 16R and 17R, all accessible vertical welds in the shroud core region are complete. The following vertical welds could not be located. V-3, V-4, V-15 and V-16.
	Fall 1996	Visual	Inspected per BWRVIP-07. Three of ten tie rods inspected, no change from installation. EVT-1, OD of V-9 and V-11, (120" total). V-9 exhibited 3 small axial cracks in HAZ on the OD totaling 1.75". The ID of V-9 was free of axial cracks. A number of small transverse cracks were found on the OD and ID of V-9. V-11 was free of any indications. Analysis showed structural margin maintained.
	Fall 1994	Ultrasonic and visual	Inspected per BWRVIP-01 and 03. Cracks were detected in the Shroud welds H2, H4, H6A, and H6B. Lack of fusion was detected in H3 weld and visual cracks on the ID surface. The Tie Rod modification was installed. Base line visual performed of the tie rods.
Shroud Support	Fall 2016	EVT-1	EVT-1 of (2) of the 36 Lug / Clevis pin assemblies - #02 and #08. No findings.
	Fall 2014	Visual	EVT-1 of 5 of the 36 Lug / Clevis pin assemblies - #11, #14, #17, #29 and #36. No findings.
	Fall 2012	UT, EVT-1, VT-3	EVT-1 of 11 of the 36 Lug / Clevis pin assemblies - #5, #6, #12, #13, #18, #22, #23, #25, #31, #32 and #35. No findings. UT of H-9 from the OD (Drywell). Inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found "no change" in the 4" long indication in the N1E nozzle area. No other findings. VT-3 of 360 deg. (100%) of top of H9 weld. No findings.

	Fall 2010	Visual	EVT-1 of 6 of the 36 Lug / Clevis pin assemblies - #1, #2, #7, #8, #20 and #21. No findings.
	Fall 2008	Visual	EVT-1 of 8 Lug / Clevis pin assemblies - #10, #11, #14, #15, #17, #29, #30, and #36. No findings.
	Fall 2006	Visual	EVT-1 of 7 Lug / Clevis pin assemblies - #1, #18, #19, #23, #24, #32 and #33.
	Fall 2004	None	No examinations required.
	Fall 2002	UT	30% UT of H-9 from the OD (Drywell). UT inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found one 4" long indication in the N1E nozzle area. This "service induced" indication is in the bottom side of the H9 weld and does not penetrate into the base metal of the RPV.
	Fall 2000	Visual	25% of H-9, cleaning performed and EVT-1 inspection completed. This completes 100% inspection of the H-9 weld. No findings.
	Fall 1998	Visual	25% of H-9, cleaning performed and enhanced VT-1, no findings
	Fall 1996	Visual	25% of H-9, (different area then the 1994 inspection), cleaning performed and enhanced VT-1, no findings.
	Fall 1994	Visual	25% of H-9 cleaning performed and enchanted VT-1, no findings.
Core Spray Piping	Fall 2016	Visual	EVT-1 of all 10 annulus piping fillet welds. No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD,

			P4gD, P4hD, P3aB, P3bB and P4dB. No findings.
	Fall 2014	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings.
	Fall 2012	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 16.5 deg. No findings. EVT-1 of 25% sample butt welds: P4dA, P4eA, P4fA, P4iA, P4bB, P4cB, P4eB, P4fB, P4gB, and P4hB. No findings.
	Fall 2010	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 285 deg. No findings. EVT-1 of 25% sample butt welds: P4aA, P4g/aA, P3aC, P3bC, P4dC, P4eC, P4fC, P4aB, P3aD, and P3bD. No findings.
	Fall 2008	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD, P4gD, P4hD, P3aB, P3bB, and P4dB. No findings.
	Fall 2006	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 103.5 deg. No findings.

			EVT-1 of 25% sample butt welds: P4bA, P4cA, P2A, P4g/aA, P4g/bA, P4hA, P4iC, P4g/aC, P4g/bC, P4hC, P4bB, P4eB, P4fB, P4gB and P4hB. No findings.
	Fall 2004	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L-3, L-3A, L-4, L-20A, L-13A, L-5, L-7, L-8, L-10, L-11, and L-12 • U-3, U-3A, U-4, U-15A, U-24A, U-7, U-8, U-9, U-10, U-11, U-12, U-16, and U-17 100% of annulus pipe brackets at 15°, 105°, 195° and 285°. No findings. EVT-1 of all creviced welds in the annulus piping = U3, U3A, U4, U15A + U24A; L3, L3A, L4, L13A + L20A.
	Fall 2002	Visual	EVT-1 of a 25% sample (11 welds) of the butt welds (non-creviced) not inspected in 17R or 18R: • U1,U15,U17,U18,U19,U20 • L1,L9,L13,L16,L20 Inspect 100% of annulus pipe brackets (15°, 105°, 195° and 285°) No Findings.
	Fall 2000	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L3, L3A, L4, L6, L13A, L14, L15 and L20A • U3, U3A, U4, U7, U8 and U15A 100% of annulus pipe brackets 15°, 105° 195° and 285°. No findings.

	Fall 1998	Visual	All creviced welds in the annulus piping; sample (25%) of the non-creviced welds in the annulus piping: • L2, L9, L10, L11, L12, L13, L17, L18, L19 and L20 • U2, U5, U6, U13, U14, U15, U21, U22, U23 and U24 Sample (25%) of pipe brackets 285°, 195°
	Fall 1996	Visual	Inspected per BWRVIP- 03. Cleaning of all accessible weld/HAZ surface and performed enhanced VT-1. No findings.
	Fall 1994	Visual and air test	Inspected VT-1, (1 mil wire). No change to pinhole weld defect detected in slip joint in 1992. Note: Pinhole weld defect detected in 1992 in System I. Analysis showed structural margin maintained
Core Spray Sparger	Fall 2016	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings except some rolled material noted on the CS SB 271 deg at the middle bracket sparger B contact point. This wear is not in a weld or HAZ of a weld. Inspected all ten sparger repair clamps. No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings.

	Fall 2014	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C & D. No findings. VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2012	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings. Inspected all 10 sparger repair clamps. No findings.
	Fall 2010	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C and D (CASS). No findings.

			VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2008	Visual	EVT-1 Sparger Pipe End Cap welds: S4A – 60 deg., S4A – 240 deg., S4B – 60 deg., S4B – 240 deg. No findings. EVT-1 "T" box welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-C. No findings. VT-1 of 50% of the sparger bracket welds – SB – 055, 065, 150, 208, 235, 271 and 330 deg. No findings.
	Fall 2006	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 60 deg., S4C - 240 deg., S4D - 60 deg., and S4D - 240 deg. No findings. EVT-1 "T" box welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-B. No findings. VT-1 of 50% of the sparger bracket welds – SB – 026, 091, 120, 179, 240, 300, and 359 deg. No findings.
	Fall 2004	Visual	Inspected all sparger repair clamps. No findings. Inspected end cap welds S4A-60, S4A-240, S4B-60, and S4B-240. No findings. Inspected sparger brackets SB-055, 065, 150, 208, 235, 271 and 330. No findings
	Fall 2002	Visual and Air Test	VT-1 all spargers, nozzles, end cap welds and repair clamps. No findings. No new leaks were identified during the Air Test.

	Fall 2000	Visual and Air Test	All sparger end cap welds were cleaned and EVT-1 inspected. No findings. VT-1 of spargers, repair clamps, and nozzles. No findings. No new leaks were identified during the Air Test.
	Fall 1998	Visual and Air Test	All sparger repair clamps, both spargers.
	Fall 1996	Visual and air test	Inspected per BWRVIP-03. Cleaned end cap welds and performed enhanced VT-1. No findings. Tee box welds are clamped and not accessible to clean or visual. Performed VT-1, (1 mil wire), of sparger piping and nozzles. No findings.
	Fall 1994	Visual and Air Test	Performed VT-1, (1 mil wire) of sparger piping and nozzles. No findings.
	1978 - 1980	Visual	(2) Cracks in sparger piping. Repair clamps installed. Note: Cracking found in sparger in 1978; repaired with clamps. Sparger has been inspected and air tested every outage since then; report submitted to NRC for approval for restart every outage.
Top Guide	Fall 2016	Visual	EVT-1 of previous top guide grid beams indications. The largest indication was measured from cell 43-44 at 3.875". Three indications that were measured in 2010 had longer lengths in the 2016 examination (slight growth less than an inch). The indications are acceptable as is for 4 years. VT-1 of two Hold Down Bolts (33 and 213 deg). No findings.
	Fall 2014	None	No inspection required this outage.
	Fall 2012	Visual	VT-1 of 2 hold-down bolts at 123 deg. and 303 deg. No findings.

	Fall 2010	Visual	EVT-1 Inspection and Measurement of 3 Cracks in Grid Beams (#4, VT-3 & VT-6). Some crack growth was observed. Flaw evaluation completed to support use as is. BWRVIP-183: Inspect 5% = 7 cells. No findings.
	Fall 2008	None	Not required for this outage by analysis.
	Fall 2006	Visual	EVT-1 of selected known flaws in grid beams: #4, VT-3 and VT-6. One area showed no growth, while the other two had grown between 0.25" and 0.75" from the 2002 outage to the 2006 outage. A flaw evaluation was performed to use-as-is.
	Fall 2004	Visual	VT-1 of top guide hold down bolts at 303 and 123 degrees. No findings. EVT-1 of VT-6 crack showed no measurable growth. Could not visually locate two other existing UT indications.
	Fall 2002	Visual	EVT-1 of two existing cracks measured in 18R outage (#3 and #5). No change to crack length identified.
	Fall 2000	Visual	Top guide hold down bolt assembly VT-3 at 33° and 213°. Top guide beam to rim fillet welds VT-1 at 33° and 213°. No findings. VT-1 of two existing cracks (#3 and #5) with cleaning. Both cracks measured on both sides. Crack #5 showed approx. 1" growth. Crack #3 showed no measurable growth.
	Fall 1998	None	Not required for this outage by analysis.
	Fall 1996	Ultrasonic 100% grid beams	12 indications emanating from notches detected at intersections of cross members. 5 of the 6 cracks on bottom

			side of member at mid-span detected. Removed sample from beam with crack to investigate root case.
	Fall 1994	Visual	[Under side of Top Guide] Three additional vertical cracks were detected at mid-span locations. Disposition use as is.
	Fall 1992	Visual	[Under side of Top Guide] Two additional vertical cracks were detected at mid-span location. Disposition use as is.
	Fall 1991	Visual	[Under side of Top Guide] A vertical crack was detected at mid-span location. Disposition use as is.
Core Plate	Fall 2016	None	No exams were required.
	Fall 2014	None	No exams were required.
	Fall 2012	None	No exams were required.
	Fall 2010	Visual	VT-1 inspected 3 In-core guide tube plugs 28-45, 44-13 and 44-21. No findings.
	Fall 2008	Visual	Visually inspected core plate wedges at 96° and 276° azimuths. No findings.
	Fall 2006	None	No exams were required.
	Fall 2004	Visual	No wedge inspections required. Inspected in-core guide tube plugs 04-29, 20-37, and 12-21. No findings.
	Fall 2002	Visual	No inspections needed. Wedges replace hold down bolt inspections.
	Fall 2000	Visual	Visually inspected all 8 wedges to verify integrity after first cycle of operation. All wedges found as installed.
	Fall 1998	Visual	Wedges installed. No further exams of core plate were performed.

	Fall 1996	Visual	Inspected top portion only of 18 hold down bolt that were not inspected in fall 1994 and top periphery section at bolt locations. No findings.
	Fall 1994	Visual	Inspected 18 hold down bolt tops only and top periphery at bolt locations inspected. No findings.
Jet Pump Assembly	N/A	N/A	N/A
Jet Pump Diffuser	N/A	N/A	N/A
SLC	Fall 2016	UT	UT examined the N12 liquid poison nozzle DM weld. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	PT	PT of Liquid Poison Nozzle to Safe End Weld. No findings.
	Fall 2010	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2008	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2006	UT	PDI - UT the Liquid Poison Nozzle N12 / SE. No findings.
	Fall 2004	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2002	Visual / PT	PT of Liquid Poison Nozzle – No Indications. Inspect insulated nozzle from drywell during RPV pressure test. No leakage observed.
	Fall 2000	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 1998	VT-2 during Code pressure test.	Not made accessible for direct exam.
	Fall 1996	None	Not made accessible.

	Fall 1994	None	Not made accessible.
CRD Guide Tube	Fall 2016	None	Not required and not made accessible.
	Fall 2014	None	Not required and not made accessible.
	Fall 2012	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 1 guide tube base for CASS (VT-1). No findings
	Fall 2010	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 2 guide tube bases for CASS (VT-1). No findings.
	Fall 2008	None	Not required and not made accessible.
	Fall 2006	EVT-1, VT-3	Inspected 4 guide tubes. No findings.
	Fall 2004	EVT-1, VT-3	Inspected 4 guide tubes. No Findings.
	Fall 2002	EVT-1, VT-3	Inspect 1 guide tube (46-43) removed to support stub tube inspection. No findings.
	Fall 2000	VT-1, VT-3	2 guide tubes. No findings.
	Fall 1998	VT-3	15, no findings.
	Fall 1996	No inspection Performed.	Not made accessible.
	Fall 1994	No Inspection Performed	Not made accessible.
CRD Stub Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.
	Fall 2010	None	No inspections required.
	Fall 2008	None	No inspections required.
	Fall 2006	None	No inspections required.
	Fall 2004	None	No inspections required.

	Fall 2002	VT-1	Visual Inspection of 2 stub tubes found leaking at bottom head in Fall 2000 (42-43 and 46-39). No indications noted.
	Fall 2000	VT-1 VT-2 pressure test	None made accessible. 2 stub tubes found leaking at bottom head (42-43 and 46-39). Performed UT of CRD housing to stub tube welds (J weld) and area of housing to be rolled. No indications. Roll repaired both leaking housings.
	Fall 1998 Fall 1996 Fall 1994	No inspection Performed.	Not made accessible.
In-Core Housing	Fall 2016	None	Not made accessible.
	Fall 2014	None	Not made accessible.
	Fall 2012	None	Not made accessible.
	Fall 2010	None	Not made accessible.
	Fall 2008	None	Not made accessible.
	Fall 2006	None	Not made accessible.
	Fall 2004	None	Not made accessible.
	Fall 2002	None	Not made accessible.
	Fall 2000	None	Not made accessible.
	Fall 1998 Fall 1996 Fall 1994	No inspection performed.	Not made accessible.
Dry Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.

	Fall 2010	Replacement	Replaced final 4 Dry tubes due to service life: IRM-15 and 16; SRM 22 and 23.
	Fall 2008	Replacement	Replaced 4 Dry tubes due to service life: IRM-12, 13, 14 and SRM-21.
	Fall 2006	Replacement	Replaced 4 Dry tubes due to service life: IRM-11, 17, 18 and SRM-24.
	Fall 2004	Visual	VT-1 of SRM 24 found tube not fully engaged in top guide. VT-1 of IRM 17 and IRM 18 found both tubes bowed.
	Fall 2002	Visual	No inspections required.
	Fall 2000	Visual	VT-1 five dry tubes. One found slightly bent – use as is. No findings on others.
	Fall 1998	Visual	VT-1 one dry tube, no findings
	Fall 1996	Visual	VT-1 one dry tube, no findings.
	Fall 1994	Visual	VT-1 four dry tubes, no findings.
Instrument Penetrations	Fall 2016 Fall 2014 Fall 2012 Fall 2010 Fall 2008 Fall 2006 Fall 2004 Fall 2002 Fall 2000 Fall 1998 Fall 1996 Fall 1994	Visual	VT-2 exam from vessel exterior. No findings.
Vessel ID Brackets	Fall 2016	VT-3	VT-3 of 2 guide rod wall brackets. No findings. VT-3 of 6 surveillance specimen brackets @ 30, 210 and 300 deg. No findings. VT-3 / VT-1 of all 4 Spargers and Nozzle Interface Areas. No changes in the indications for spargers at 45 and 135 deg.

	Fall 2014	EVT-1	Inspected all 4 dryer support brackets. Minor changes in wear patterns were evaluated for continued service.
	Fall 2012	None	No inspection required.
	Fall 2010	EVT-1	EVT-1 all feedwater sparger attachment wall bracket welds. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	EVT-1	EVT-1 both Guide Rod Brackets. EVT-1 all 3 Surveillance specimen brackets. No findings.
	Fall 2004	EVT-1	Inspected all 4 dryer support brackets. No findings.
	Fall 2002	EVT-1	All feedwater sparger attachment brackets. Both guide rod attachment brackets. All surveillance sample brackets (30, 210 and 300 degree locations) No indications on attachment welds.
	Fall 2000	EVT-1	All 4 dryer support brackets. Observed wear indications on brackets. No indications on attachment welds. All feedwater attachment brackets inspected. No indications on attachment welds. Cracks observed on feedwater sparger to end bracket welds (non-safety-related component) on 2 ends.
	Fall 1998 Fall 1996 Fall 1994	VT-1	VT-1 of accessible portions of weld on guide rod brackets, steam dryer brackets, surveillance sample brackets. All attachment welds; no findings.
LPCI Coupling	N/A	N/A	N/A
Fuel Support Casting	Fall 2016	Visual	VT-1 Inspection of 1 Fuel Support Casting Cell 26-47. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	Visual	VT-1 Inspection of 1 Fuel Support Casting. No findings.

	Fall 2010	Visual	VT-1 inspection of 2 CRGT Bases (support castings) for CASS program. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	None	None inspected.
	Fall 2004	None	None inspected.
	Fall 2002	None	None inspected.
	Fall 2000	Visual	VT-3 (2) support casting. No findings.
	Fall 1998	Visual	VT-3 (24) support castings. No findings.
	Fall 1996	Visual	VT-3 (25) support castings. No findings.
	Fall 1994	Visual	VT-3 (17) support castings. No finding
Reactor DM Welds (BWRVIP-75-A)	Fall 2014	UT - Auto	UT examined eight (8) dissimilar metal (DM) welds containing alloy 82/182. This included three (3) DM welds on the top head. No new findings identified.
	Fall 2012	UT - Auto	UT examined three (3) Category D nozzle to flange dissimilar metal (DM) welds containing alloy 82/182. No findings. UT examined one (1) Category C recirculation suction nozzle to safe end DM weld N1A. Found no change to previously identified flaw and updated the flaw evaluation for another 2 cycles.
	Fall 2010	UT - Auto	UT examined four (4) Category C nozzle to safe end dissimilar metal (DM) welds containing alloy 82/182. No findings.

	Fall 2008	UT – Auto	UT examined five (5) Category C nozzle to safe end dissimilar metal (DM) welds. One indication identified in N1A recirculation suction nozzle to safe end weld dispositioned as acceptable for 2 cycles in accordance with IWB-3600 flaw evaluation. The 0.21 inch ID connected indication was in the RPV nozzle to clad interface on the Reactor side of the Alloy 182 DM weld. The flaw evaluation was submitted to the NRC.

Note: All indications left "as is" were analyzed and structural margins were acceptable for continued service.

Reactor Internals Inspection History

Plant: **Peach Bottom Atomic Power Station, Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1994	UT & VT	Comprehensive UT Baseline of some Category "C" circumferential welds (H-2, H-3, H-4, and H-5) per BWRVIP-01, Rev. 0. Partial UT baseline of welds H-1, H-6, and H-7, w/ partial Enhanced VT-1 of H-6 OD. 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-6, and OD of H-4 and H-5. Full structural margins calculated using two cycles of crack growth for comprehensively examined welds, one cycle for welds with limited exams. No indications identified on H-2 and H-7.
	1996	UT	Comprehensive UT of welds H-1, H-6 and H-7 per BWRVIP-01, Rev. 1. Exams per BWRVIP-03. Indications identified on ID of welds H-1, H-6 and H-7, on OD of weld H-1. Full structural margins calculated using two cycles of crack growth. Reexaminations planned per BWRVIP-76
	2002	UT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76. Indications identified on each weld. UT of Vertical welds V-1 through V-4. No indications identified. Reexaminations scheduled per BWRVIP-76.
	2012	UT & VT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76, Rev. 1. Indications were identified on all horizontal welds. Horizontal welds H1, H2, H3 and H4

			were evaluated and found acceptable for continued service via a plant specific analysis performed by SIA. Horizontal welds H5, H6 and H7 were evaluated via Table 2-1 of BWRVIP-76. UT of vertical welds V-1 through V-8 were performed with one indication identified on the V-3 weld. The indication was determined to be acceptable for continued service. EVT-1 examinations were performed on the following: shroud ID of the H-4 weld at 045 degrees, the shroud ID intersection of the V-5 and H-4 welds at 090 degrees, shroud ID intersection of the V-6 and H-4 welds at 270 degrees. No indications were identified during the visual inspection of the core shroud.
Shroud Support	1992	VT-3	VT-3 examination of support leg stub welds. No indications identified. VT-3 examination of welds H-7, H-8, and shroud support cylinder. No indications identified.
	1994	VT-3	VT-3 of accessible portions of H-8 weld between Jet Pump #1 and #10. No indications identified.
		VT-1	VT-1 examination around perimeter of 0 deg. access hole cover. No indications identified.
		UT	UT examination of both access hole covers. No indications identified.
	1998	EVT-1	EVT-1 examination of both AHCs. No indications identified. EVT-1 of 10% of shroud support weld H-8, top side, no indications identified. EVT-1 of 10% of shroud support weld H-9, top side, no indications identified.
	2000	EVT-1	EVT-1 examination of both AHCs. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 0° and 180° Azimuth. No indications identified.

	2002	UT	UT of 10% of H-9 weld length from OD of vessel. No indications identified.
	2004	EVT-1	EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 180° and 360°. No indications identified
	2008	EVT-1	EVT-1 examination of both AHCs. No indications identified.
	2010	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		UT	BWRVIP-180 baseline UT exams were completed on both AHCs. No indications identified.
	2012	EVT-1	EVT-1 of the H-9 weld was performed on the 157.5°-202.5° and the 337.5°-022.5° degree segments of the weld. No indications were identified. Note: Examination coverage of the H-9 weld was greater than 10% of the weld.
	2016	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of 10% of shroud support weld H-8, the 157.5 -202.5 deg and 337.5-022.5 deg segments of the weld. No indications identified.
Core Spray Piping	1980 to 1996	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.
	1996	VT-1 (1/2 mil)	EVT-1 (1/2 mil resolution) performed on annulus piping welds per BWRVIP-18. Cracking identified in "B" Header tee-box cover plate weld (P2B). UT performed to characterize indication.

			Evaluation demonstrated structural margin for one operating cycle
	1998	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique. EVT-1 used to supplement UT. No new indications identified. P2B weld reexamination yielded additional margin.
	2000	EVT-1	EVT-1 of nine (9) piping welds not previously UT'd, and of six (6) pipe brackets and attachment welds. No indications identified.
	2002	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (28 welds). EVT-1 used to supplement UT (6 welds). EVT-1 on two (2) support brackets. No new indications identified. P2B weld indication reexamination revealed minimal growth.
	2004	EVT-1	EVT-1 of twelve (12) piping welds not accessible for UT inspection. No indications identified
	2006	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). EVT-1 used to supplement all one-sided UT (12 welds). EVT-1 only on eight (8) pipe welds and six (6) support brackets. P2B weld indication reexamination revealed no growth. New 9/16" indication identified visually at intersection of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.
	2008	EVT-1	Re-inspection per BWRVIP-18, EVT-1 used on (21) pipe welds. P2B weld indication re-examination revealed no growth. The P3B1 9/16" indication revealed no growth. New indication (0.49") identified visually on the upper side of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.

	2010	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). Two sided UT performed on selected P4 elbow welds. EVT-1 used to supplement all one-sided UT on T-box welds (8 welds). P2B weld indication reexamination revealed no growth. P3B1 indications identified some change in measured size due to better cleaning and exam video resolution. . Structural and leakage evaluations found flaw acceptable for continued service.
	2012	EVT-1	EVT-1 examination of 17 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2014	EVT-1	EVT-1 examination of 33 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2016	EVT-1	EVT-1 examination of (7) pipe welds. The examinations re-identified indications on the P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for one cycle. All other examinations identified no indications.
Core Spray Sparger	1980 to 1994	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13, Cracking discovered at tee-box to sparger pipe weld ("B" Sparger, 1982), bolted repair clamp installed. No other indications identified.
	1998	VT-3 & MVT-1	Reinspections per BWRVIP-18, no indications identified.
	2000	EVT-1	EVT-1 of selected sparger welds per BWRVIP-18. No indications identified.

		VT-1	VT-1 of sparger tee-box repair clamp, and approx. 50% of sparger "C" and "D" nozzles and drains. VT-1 of eleven (11) sparger brackets and welds. No indications identified.
	2002	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of seven (7) sparger pipe welds. No indications identified.
	2004	VT-1, EVT-1	VT-1 of six (6) Sparger support bracket welds, one (1) sparger drain, and 50% of nozzles on spargers "C" and "D". EVT-1 of fifteen (15) Sparger pipe welds. No indications identified.
	2006	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2008	EVT-1, VT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. EVT-1 of ten (10) sparger pipe welds. No indications identified.
	2010	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2012	VT-1, EVT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. One recordable indication was identified on sparger bracket 04. The indication was defined as deformation on the top, middle and lower brackets. The deformation was concluded to be minor and would not impact the ability of the bracket to support the sparger piping. EVT-1 of six (6) sparger pipe welds identified no indications.

	2014	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
Top Guide (Rim, etc.)	1976 to 1994	VT-3	VT-3 exam every other refueling outage per Section XI. No indications identified.
	1987	UT	UT examination performed of specific cells. No indications identified.
	1994	VT-3	Visual (VT-3) examination of 4 cells (48-41, 08-25, 24-17, and 24-25), per SIL 554. No indications identified.
	1996	VT-3	Visual (VT-3) of 2 aligner pins (0 deg. And 270 deg.), per SIL 588. No indications identified.
	2012	EVT-1	EVT-1 examinations were performed on nineteen (19) top guide cells in accordance with BWRVIP-183. No indications were identified.
Core Plate (Rim, etc.)	1996	VT-3	VT-3 examination of all accessible hold down bolts (cell 16-57, and area at 0 and 270 deg. Azimuth. No indications identified.
	2010	VT-3	VT-3 examination of 16 core plate plugs. No Indications identified.
	2012	VT-3	All 129 core plate plugs were replaced with the new design. VT-3 of nine (9) core plate bolts was performed. No indications were identified.
SLC	1992	PT	Surface (PT) examination of nozzle to safe end weld per Section XI. No indications identified.
	1998	PT & UT	PT and UT of N10 nozzle to safe-end, no indications identified.
	2002	PT	Extended dwell time Liquid Penetrant examination of entire safe end.

			No indications identified.
	2006	PT	Extended dwell time Liquid Penetrant examination of entire safe end. No indications identified
	2010	UT-E	SLC Nozzle to safe end weld. No indications identified.
Jet Pump Assembly	1976–1996	VT-3	Visual VT-3 of all jet pump components performed every other refueling outage.
	1981	VT & UT	VT and UT examination performed on all 20 hold down beams. No indications identified.
	1994	VT	Restrainer bracket wedge misalignment and wear identified on several wedges. Evaluations found condition acceptable without repair. One restrainer bracket set screw tack weld found cracked. Evaluations found condition acceptable without repair.
	1996	VT	Restrainer bracket wedge conditions and set screw tack welds remain unchanged, condition acceptable without repair.
	1998	MVT-1	MVT-1 of: RS-1 weld on all 10 risers, RS-2 & RS-3 welds on 6 of 10 risers. No indications identified.
		UT	UT of all 20 hold down beams. No indications identified.
	2000	EVT-1	EVT-1 of adjusting screw tack weld (jet pump 7) and RS-2 & RS-3 on 5 of 10 risers. No indications identified.
	2002	EVT-1	EVT-1 of fifty (50) Medium priority weld locations. EVT-1 of transition region of two (2) hold down beams. No indications identified
	2004	EVT-1	EVT-1 of forty one (41) medium priority welds, to complete 50% baseline inspections. No indications identified.

		UT	UT performed on all twenty (20) hold down beams (3 zones, BB-1, BB-2, and BB-3). No indications identified.
		VT-1	VT-1 on all twenty (20) Inlet Mixer main wedges. Thirteen (13) jet pumps exhibited additional wear at main wedge-to-restrainer bracket interface. Performed expanded scope of inspections on these jet pumps. Set screw gaps identified at five (5) jet pumps. No additional problems identified. Installed eight (8) slip joint clamps and three (3) set screw auxiliary spring wedges, to mitigate wear believed to be caused by vibration.
	2006	VT-1, EVT-1, VT-3	VT-1 of twenty (20) WD-1 locations. EVT-1 of five (5) IN-4 welds, and two (2) riser braces-to-vessel attachment welds. VT-3 of eight (8) Slip Joint Clamps and three (3) Auxiliary Spring Wedges. Expanded EVT-1 scope on three (3) jet pumps due to WD-1 findings.
	2008	UT	UT exams performed on all 20 jet pump hold down beams. No indications identified.
		VT-3	Visual inspections performed on 5 auxiliary spring wedges installed. No indications identified.
		EVT-1	EVT-1 of 50 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Expanded EVT-1 scope on one jet pump due to WD-1 findings.
		VT-1	VT-1 of twenty (20) WD-1 locations. Re-examined previously identified wedge wear with no apparent changes noted on 19 of 20 inspections. One main wedge had additional wear into the restrainer

			bracket. BWRVIP 41 expanded scope inspections were performed with no additional indications identified. One Slip joint clamp was installed on the affected Jet Pump.
	2010	VT-3	VT-3 of two slip joint clamps. No indications identified
		VT-1	VT-1 of all twenty (2) JP main wedges. No new/additional wear identified. VT-1 of all JP set screws for gaps. Minor gaps identified on seven JPs. Five (5) accepted for continued service by engineering analysis. Two (2) were corrected by tapping down on the main wedge.
		EVT-1	EVT-1 of 37 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Completed BWRVIP Letter 2009-202 required inspections.
	2012	VT-3	VT-3 of seven slip joint clamps. Minor wear detected on JP 15 slip joint clamp. Wear was acceptable for continued use and will be re-inspected next outage.
		VT-1	VT-1 of all twenty (20) JP main wedges. New wedge wear identified on JP 16 and accepted for continued use. New wedge rod wear identified and accepted for continued use on JPs 1, 2, 5, 10, 11, 12, 14, 17 and 20. VT-1 of three (3) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. VT-1 of set screw gaps were performed on seven (7) JPs. Five of the jet pumps had minor gaps which were acceptable for continued use by an engineering analysis.

		EVT-1	EVT-1 of 20 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser pipe to transition piece weld, riser brace leaf to RPV Pad Weld, riser pipe to restrainer bracket circumferential weld and the bottom of the nozzle casting to the top of the mixer assembly weld (IN-4). No indications identified.
	2014	VT-3	VT-3 of nine (9) slip joint clamps. Minor wear detected on JP 05 and JP 15 slip joint clamps. Wear was acceptable for continued use and will be re-inspected next outage. New slip joint clamps were installed on JP 16 and JP 20 as a result of new wear on the belly band, and restrainer bracket.
		VT-1	VT-1 of all twenty (20) JP main wedges. Slight new wedge wear identified on JP 16 and accepted for continued use. The wedges on the bottom side on JPs 13 and 16 appeared to be lower. New wedge rod wear identified and accepted for continued use on JPs 06, 13 and 20.
		VT-1	VT-1 of eight (8) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. The auxiliary wedges on JPs 10 and 18 were found in the over-travel and were replaced. The aux. wedge on JP20 was also found in the over-travel position and a slip join clamp was installed which resulted in no set screw gaps. Both aux wedges on the shroud side and vessel side on JP 20 were then removed.
		VT-1	VT-1 of set screw gaps were performed on jet pumps without a slip joint clamp or auxiliary wedge. All as-left gaps were acceptable for continued use and none exceeded the 0.010" criteria for installation of an auxiliary wedge.

	2016	VT-1	VT-1 of four (4) slip joint clamps. Minor wear detected on JP 05 SJC. Wear was acceptable for continued use.
		VT-1	VT-1 of (20) main wedges. New wedge rod wear identified on JP 03, 13 and 16 and accepted for continued use. The wedges on JPs 12, 14 and 20 appeared to be lowered.
		VT-3	VT-3 of three auxiliary wedges. Minor wear identified on JP 13 and 18 aux wedges and accepted for continued use.
		EVT-1	EVT-1 of 28 medium and high priority welds including riser pipe to riser brace welds, riser elbow to thermal sleeve, inlet and mixer connections, riser elbow to riser pipe welds etc. A 1 5/8" flaw was noted on JP11/12 RS-1 weld and was accepted as is with re-inspection next outage in 2018.
Jet Pump Diffuser	1998	MVT-1	MVT-1 of: AD-1 & AD-2 welds on 12 of 20 pumps, AD-3A & B welds on 11 of 20 pumps, and DF-2 weld on 10 of 20 pumps. No indications identified.
	2000	EVT-1	EVT-1 of AD-1, -2, -3a, -3b, and DF-2 on jet pumps 1 through 10. No indications identified.
	2002	EVT-1	EVT-1 of ten (10) High priority weld locations. No indications identified.
	2004	EVT-1	EVT-1 of eleven (11) medium priority weld locations, to complete 50% baseline inspections. No indications identified
	2006	UT	UT of ninety eight (98) Diffuser / Adapter welds and six (6) Inlet Mixer welds. One 2" indication found on DF-2 weld, JP 17. Structural and leakage evaluations found indication acceptable for continued service.

	2010	EVT-1	EVT-1 of JP 17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified.
	2012	EVT-1	EVT-1 of JP-17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified. This examination was a recommendation from the 2012 BWRVIP INPO review visit.
	2016	EVT-1	EVT-1 of (60) Diffuser / Adapter welds. Indications were identified on (11) Jet Pumps out of 20 AD-3a/b backing ring. Largest indication on JP03 ~3.6 inches. Indications were acceptable as is with re-inspection next outage.
		EVT-1	EVT-1 of JP-17 DF-2 weld from the OD to look for any visual indication of the flaw identified by UT in 2006. 40% coverage of the OD was achieved, all suspect areas were investigated and no indication was identified.
CRD Guide Tube	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified
	2002	EVT-1, VT-3	EVT-1 of three (3) welds on each of ten (10) Guide Tubes (locations 50-31, 42-11, 42-23, 42-51, 38-27, 38-35, 38-51, 34-23, 34-39, and 30-31). Some flow interference with examinations. VT-3 equivalent of anti-rotation pin on ten (10) Guide Tube locations. No indications identified
	2006	EVT-1, VT-3	EVT-1 of fifteen (15) CRGT welds, VT-3 of five (5) CRGT welds, verification of seventeen (17) CRGT alignment pins. One slightly bent pin identified. Pin remains functional. Condition found acceptable. No other indications identified.

	2008	EVT-1	EVT-1 of nine (9) CRGT welds. No indication identified. Also, verification of eight (8) CRGT welds and (8) CRGT alignment pins.
	2010	EVT-1	EVT-1 of four (4) CRGT welds. No indications identified. All BWRVIP-47 baseline examinations have been completed.
CRD Stub Tube	1992	VT-3	VT-3 examination of stub tube welds accessible from fuel cells 26-31 and 30-27. No indications identified.
In-Core Housing	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
Dry Tube	1984		All Dry Tubes replaced in 1984
	1994	VT-1	VT-1 examination of IRM Dry Tube 2D, at core location 37-32.
	1997	N/A	All IRM and SRM tubes replaced w/ Wide Range Monitoring tubes in 1997. No inspections required.
	2016	N/A	The 1997 WRNM replacement left four dry tubes as spares, with no detector installed. All four spare dry tubes were replaced in 2016.
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.
LPCI Coupling			N/A for this plant
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 per ASME Section XI. No indications identified.
	2000	EVT-1	EVT-1 of six (6) Core Spray piping brackets. No indications identified.
	2002	EVT-1	EVT-1 of two (2) Core Spray piping brackets, two (2) Steam Dryer support

			brackets, and five (5) Jet Pump Riser brackets attachment welds. No indications identified.
	2004	EVT-1	EVT-1 of two (2) Steam Dryer support brackets and three (3) Jet Pump riser brace attachment welds.
		VT-3	VT-3 of four (4) Steam Dryer hold down brackets and three (3) lower surveillance brackets. No indications identified.
	2006	EVT-1, VT-3, VT-1	EVT-1 / VT-3 of twelve (12) Feedwater Sparger attachment bracket welds. EVT-1 / VT-1 of two (2) Jet Pump riser brace-to-vessel welds. No indications identified. Minor anomalies incidentally identified on several FW Sparger bracket pins.
	2008	VT-3	VT-3 of 5 Feedwater Sparger end brackets and attachment pins
		EVT-1	EVT-1 of 2 Core Spray bracket attachment welds
	2012	VT-3	VT-3 of 6 feedwater sparger end brackets and attachment pins. Wear identified on 5 of the 6 feedwater spargers end brackets and/or attachment pins. Wear was acceptable for continued use.
		EVT-1	EVT-1 of 8 Core Spray bracket attachment welds. No recordable indications. EVT-1 of 4 steam dryer support brackets. No recordable indications.
	2014	EVT-1, VT-1, VT-3	EVT-1/ VT-3 of four (4) Steam Dryer support brackets. New wear was observed at locations 094 and 274 deg and acceptable with engineering evaluation. Previously noted wear was observed on 004 and 184 deg with no changes. EVT-1 of four (4) Jet Pump Riser brackets attachment welds. No indications identified.

			VT-1 of three (3) lower surveillance brackets. No indications identified.
	2016	VT-3 EVT-1	EVT-1/ VT-3 of four Steam Dryer support brackets. New wear was observed at all locations and acceptable with engineering evaluation. The wear is consistent with the new footprint of the replacement dryer versus the OEM dryer, with the 40% increase in weight. EVT-1 of (3) Jet Pump Riser brackets attachment welds. No indications identified. EVT-1 of 2 Feedwater sparger end brackets and attachment pins. Wear identified was acceptable for continued use.
Steam Dryer	2002	VT-1, VT-3	VT-1 of all drain channel welds. VT-1 of upper and lower dryer bank tie bar welds and baffle plate welds. VT-3 of dryer bank end and top covers, and instrument tubing and supports. One (1) central bank upper tie bar severed, and one (1) instrument tube support-to-baffle plate broken. Broken tie bar and instrument tube removed from dryer. New, stiffer tie bars welded to central dryer banks.
	2004	VT-1	VT-1 of five (5) replaced central bank upper tie bars, ten (10) original bank upper tie bars, and outer bank hoods @ internal reinforcing plates and end plate welds, per SIL 644, Supp.1. No indications identified.
	2006	VT-1	Completed all remaining BWRVIP-139 recommended inspections on seventy four (74) locations. One small indication (7/16") identified at base of drain channel vertical weld. No other indications identified.

	2008	VT-1	Re-examined small indication (7/16") identified at base of drain channel vertical weld. No change noted. No other indications identified.
	2010	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A re-examination of (six) key high stress (red) locations and five (5) tie bars. No indications identified. Examination of all four (4) lifting lugs. Indications identified on anti-rotation tack welds. Accepted continued service by engineering evaluation.
	2012	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A examination of eight high stress (red) locations and seven (7) tie bars. No indications identified in high stress locations. Existing deformation was identified in two of the tie bars and was accepted for continued service by an engineering evaluation. Examination of all four (4) lifting rod assemblies identified existing indications on each lifting rod assembly. These indications were accepted for continue service by engineering evaluation.
	2014	Replace-ment	As part of the EPU License Amendment Request (LAR), Exelon PBAPS replaced the Original Equipment Manufacturer (OEM) steam dryer with a 3-ring octagonal (Nordic style) Westinghouse dryer.
	2016	VT-3	General VT-3 as found was performed on: - Top and sides (incl. outside of skirt) - underside of RSD (incl. inside of skirt) - W and U channel guides - hold down rods and lifting rods - outer, middle and inner hoods - and support ring.

		VT-1	VT-1 of (71) recommended locations by the manufacturer. Indications were identified at bottom of the hold down rods on construction/ non-structural welds for all (4) HDRs and evaluated as acceptable as is with no repair. The welds will be reinspected next outage in 2018. No other indications identified.
Steam Separator	2006	VT-1	VT-1 examinations performed on a sample of upper and lower shroud head bolt support ring gussets. 12 of 24 lower ring gussets revealed degradation. No indications on upper support ring gussets. Indications acceptable for continued service.
	2008	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. 5 of 12 lower ring gussets with previously identified degradation had further crack growth and 4 lower gussets had new indications not previously identified. No indications were observed on the upper support ring gussets. All Indications are acceptable for continued service.
	2010	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. Slight growth at one previously identified indication. New indication identified on six (6) gussets. All new indications were minor and acceptable for continued service. Wear identified on one (1) shroud head bolt pin/window. SHB was removed.
	2012	VT-1	VT-1 examinations were performed on all mid support ring gussets with new indications identified. These indications were acceptable for continued service based on an engineering evaluation. VT-1 examinations were performed on three shroud head bolts with indications identified on all three.

			VT-1 of four upper support ring gussets revealed no indications. VT-1 of all four lifting lug assemblies revealed existing indications on all four assemblies. These indications were acceptable for continued service as a result of an engineering evaluation.
	2014	VT-1	VT-1 examinations were performed on all (24) mid support ring gussets with (4) new indications identified. These indications were acceptable for continued service based on an engineering evaluation.
		VT-3	VT-3 examinations were performed on all (31) shroud head bolts with indications identified on (13) SHB. These indications were acceptable for continued service based on an engineering evaluation. Three (3) new SHB were installed as part of EPU.
		VT-1	VT-1 of four upper support ring gussets revealed no indications and VT-1 of all four lifting lug assemblies revealed previously identified indications on all four assemblies with no changes.
	2016	VT-3	VT-3 of (5) shroud head bolts.
		VT-3	VT-1 of (4) upper support ring gussets and (8) middle ring gussets revealed indications that were acceptable for continued service based on an engineering evaluation.
		VT-1	VT-1 of all four lifting lug assemblies revealed previously identified indications with no changes.
Dissimilar Metal Welds (BWRVIP-75-A)	2008	UT-E (E = encoded)	Performed Manual UT on three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was not ID connected and determined to be a fabrication flaw after comparison to

			construction radiographs. Indication was found acceptable, no further analysis or repairs required.
	2010	UT-E	Performed Manual UT of three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. No indications were identified.
	2012	UT-E	Performed Manual UT of six (6) IGSCC Category D welds. Three of these welds were dissimilar welds. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was evaluated per the requirements of Table IWB-3514-2 of ASME Section XI and was found to be acceptable.
	2014	UT-E	Performed Manual UT of one IGSCC Category D dissimilar weld, 3-I-19R (RPV, Nozzle N9 to Cap). No indications were identified.
	2016	UT-E	Performed Auto UT of (3) IGSCC Category D DM weld and Manual UT of one IGSCC Category A DM weld. No indications were identified.

BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Fall 2016 Outages

June 2017

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Reactor Internals Inspection History

Plant: **Browns Ferry Nuclear Plant: Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	2005	UT	Baseline: UT (two-sided) examination of H1, H2, H3, H4, H5, H6, H7 performed per BWRVIP-76. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 83.0% / 0.0% H1 / Lower / 82.1% / 2.1% H2 / Upper / 81.8% / 0.4% H2 / Lower / 88.7% / 0.0% H3 / Upper / 88.7% / 0.0% H3 / Lower / 79.2% / 5.1% H4 / Upper / 90.0% / 20.1% H4 / Lower / 89.6% / 2.6% H5 / Upper / 91.3% / 1.2% H5 / Lower / 91.3% / 0.0% H6 / Upper / 91.9% / 0.0% H6 / Lower / 91.9% / 11.2% H7 / Upper / 91.4% / 12.0% H7 / Lower / 78.0% / 0.0%
	2016	UT	Reinspection per BWRVIP-76, UT (two-sided) examination of H1-H7; Baseline per BWRVIP-76, UT examination of V3 and V4. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 84.6% / 0.0% H1 / Lower / 87.8% / 1.2% H2 / Upper / 87.9% / 0.3% H2 / Lower / 87.0% / 0.0% H3 / Upper / 86.8% / 0.0% H3 / Lower / 86.9% / 5.8% H4 / Upper / 97.5% / 23.4% H4 / Lower / 98.3% / 4.8% H5 / Upper / 92.1% / 0.0% H5 / Lower / 92.7% / 0.0% H6 / Upper / 93.2% / 0.0% H6 / Lower / 100.0% / 4.2% H7 / Upper / 100.0% / 2.4% H7 / Lower / 100.0% / 0.0%

			V3 / CCW Side / 96.5% / 0.0% V3 / CW Side / 88.7% / 0.0% V4 / CCW Side / 87.8% / 0.0% V4 / CW Side / 87.7% / 0.0%
Shroud Support	2005	VT-1, VT-3	Access Hole Cover Welds at 0° and 180°: Replacement required prior to Unit 1 Restart - Both access hole covers replaced with bolted repair design per DCN 51193. VT-1 visual baseline exam performed to inspect nut to retainer tack welds only. VT-3 visual baseline exam performed to document the as-left condition of the AHCs. No relevant indications on either cover.
		EVT-1	Baseline inspection per BWRVIP-104 of the H8 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. No relevant indications.
		EVT-1, UT	Baseline inspection per BWRVIP-104 of the H9 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. Also performed UT from the outside surface of the RPV obtained from access of the N1A and N1B (Recirculation outlet nozzles) windows. Achieved coverage was calculated to be 19%. No relevant indications.
		VT-3	Baseline inspection per BWRVIP-104 of the H10 and H12 welds at 0 and 180 degrees. These inspections were performed through the access hole cover openings during the repair. No relevant indications.
	2008	VT-3	VT-3 visual inspection of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and

			the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
	2012	EVT-1	Reinspection of Shroud Support weld H-8 (EVT-1) at 0° and 180° per BWRVIP-38. No reportable indications were found.
	2016	EVT-1	Reinspection of Shroud Support weld H-9 (EVT-1) per BWRVIP-104. No reportable indications were found. Visual inspection per BWRVIP-180 (VT-1 from the top surface) and vendor recommendation (VT-3) of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
Core Spray Piping	2001	UT	Baseline inspection per BWRVIP-18: UT of T-Box welds @ 120 (P2) and 240 degrees (P2, CP3). UT of elbow and sleeve welds for Downcomers A through D (P4a, P4b, P4c, P5, P6, and P7). No relevant indications.
	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations (T-Box welds @ 120 (P1, AP3, BP3) and 240 degrees (P1, DP3), Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees). EVT-1 visual examinations of elbow and sleeve welds for Downcomers A through D (P4d, P8a, P8b). No relevant indications.
	2008	EVT-1	Reinspection per BWRVIP-18-A: EVT-1 visual inspections of T-Box Welds (P1 (120° & 240°), AP3, BP3, DP3) and Downcomer Welds (AP4d, A-D8a, A-D8b); no relevant indications were observed.
	2010	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds

			@120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. UT of elbow and sleeve welds (P4a, P4b, P4c, P4d, P5, P6, P7, P8a, & P8b) performed for Downcomers A through D. Two indications (1.04" and 2.20") observed on weld P4a on A Downcomer on the pipe side of the weld. Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R9 (2012). Supplemental EVT-1 visual inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2012	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
	2014	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees); no relevant indications were observed. UT of elbow weld P4a performed for Downcomer A and elbow welds P4a, P4b, P4c, & P4d performed for Downcomer B. Two indications observed on Weld P4a on Downcomer A were resized (0.40" and 2.37") and two additional indications were identified (0.52" and 0.23"). Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R11 (2016). UT of sleeve welds (P5, P6, P7, P8a, & P8b) performed for Downcomers A through D; no relevant indications were observed. Supplemental EVT-1 visual

			inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2016	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
Core Spray Sparger	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations of sparger welds (S1, S2, S4). BS2-R weld @ 9 degrees (Sparger to T-Box Weld, R side (Lower Sparger) recorded a crack adjacent to the weld and was structurally replaced by weld repair clamp per DCN 51193. AS2-R weld @ 354 degrees (Sparger to T-Box Weld, R side (Upper Sparger) recorded a pin hole adjacent to the weld and evaluated as "accept as is". Otherwise, no relevant indications.
		VT-1	Baseline inspection per BWRVIP-18: VT-1 visual examinations of sparger welds (S3a, S3b, S3c, Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees). No relevant indications.
	2008	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger welds (S1, S2, and S4) and VT-1 visual examinations of Sparger welds (S3a, S3b, and S3c) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2012	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger A, C, D welds (S1 and S2 [L & R]), and Sparger A, B, C, D welds (S4 [L & R]) and VT-1 visual examinations of Sparger A, B welds (S3a, S3b, and S3c [L & R]) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2016	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
Top Guide (Rim, etc.)	2005	VT-3	Baseline inspection (NON-BWRVIP): VT-3 visual examinations of Locations 4 (Grid Beam to Rim Top / Bottom Cover Plate Pins), 6 (Fuel Guard Weld and Bolting), 12 (Rim & Cover Plate Fabrication Weld), and 13 (Eye Bolt Boss). 1 area recorded as a condition on the plate (Location 12), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1	Baseline inspection (NON-BWRVIP): EVT-1 visual examinations of Locations 1 (Grid Beam & Beam to Beam Crevice Slot) and 10 (Rim Pins). 3 areas recorded as not acceptable (Location 1), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1, VT-1	Baseline inspection per BWRVIP-26: Inspected Rim Welds (Location 11) (EVT-1) and Aligner Pins (Locations 2/3) (VT-1) at all locations. No relevant indications.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
	2014	EVT-1	Baseline (2014) per BWRVIP-183: Location 1 (Grid Beam and Beam-to-Beam Crevice Slot) inspected for ten grid beam cells; no reportable indications.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
Core Plate (Rim, etc.)	2005	EVT-1, VT-3	Baseline inspection per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were EVT-1 inspected from the top side, and seventeen (17) holddown bolts (50%) were inspected from the bottom side with no reportable indications. All one hundred twenty-nine (129) plugs (Location 13) were VT-3 inspected; three plugs were replaced.
	2008	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Three (3) core plate plugs replaced during Unit 1 Recovery were VT-3 examined to confirm that the replacement plug was in place. No evidence of movement, wear, or misalignment was visible.
	2010	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2012	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2014	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2016	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
SLC	2007	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.

	2008	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
	2014	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
		UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
Jet Pump Assembly	2005	UT, VT-1	Baseline (2006) per BWRVIP-41, -138: UT of holddown beam locations BB-1, BB-2, and BB-3 (Jet Pumps 1 thru 20) - no reportable indications. Baseline (2005) per BWRVIP-41 of all High and Medium Priority Weld locations. Circumferential crack indication in backing ring for DF-3 weld (Jet Pump 19) will be inspected for change during U1C7 RFO in Nov. 2008.

			Baseline (2005) per BWRVIP-41: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); No wedge wear observed. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified nine (9) set screw gaps ranging from 12 to 35 mils in width. Two reportable linear indications identified on one of two set screw tack welds for Jet Pump Nos. 15 (shroud-side) and 16 (vessel-side). Nine (9) auxiliary wedges installed on Jet Pumps 2, 3, 4, 6, 7, 8, 10, 12, and 14.
	2008	VT-3	VT-3 visual examination of the holddown beam for Jet Pump #8 was performed in response to misalignment concerns raised during Unit 1 Recovery and an RFI identified during the October 2007 INPO BWRVIP Review Visit. There was a minor misalignment with the beam but no relevant indications were observed. VT-3 visual examination of sensing line clamps installed during Unit 1 Recovery on Jet Pumps 1-5 and 11-15 performed to confirm that all of the repair hardware is in place and that the hardware has not shifted or changed from the as-installed condition. No relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was previously recorded during Unit 1 Recovery and does not appear to have changed.
		VT-1	Reinspection per BWRVIP-41 R1: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted. Indication of vertical wedge movement at ten (10) locations was observed, but the movement markings did not appear to be recent and correlated

			with findings during the Unit 1 Recovery examinations. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified no new set screw gaps. Inspection results identified eight apparently new set screw tack weld indications in addition to the two set screw tack weld indications that were previously observed during Unit 1 Recovery. Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery were inspected to verify contact; no relevant indications were observed.
	2010	EVT-1	Reinspection per BWRVIP-41, Rev. 3: EVT-1 of Medium Priority Locations RS-8 and RS-9 (Jet Pumps 1 thru 20) performed in accordance with BWRVIP Letter No. 2009-202 ("Interim Guidance for Accelerated Inspections of Jet Pump Riser to Riser Brace Welds and Wedges"); no relevant indications.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was unchanged from U1R7.
		VT-1	Reinspection per BWRVIP-41 R3: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted; three new instances of minor wedge wear since U1R7 noted at Jet Pumps 1, 6, and 10 determined to be the result of routing service during operation. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified one new set screw gap (Jet Pump 20: Shroud-Side Set Screw - 17 mils). Evaluation performed to provide one fuel cycle (U1C9) of continued operation.

			Inspection results identified two apparently new set screw tack weld indications on Jet Pump 17 in addition to the nine set screw tack weld indications that were previously observed during U1R7 (NOTE: An indication that was identified during U1R7 for Jet Pump 14 was accidentally counted twice). Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle (U1C9).
	2012	UT, EVT-1, VT-1	Reinspection per BWRVIP-41 R3, -138 R1: UT of holddown beam locations BB-1 and BB-2, (Jet Pumps 1 thru 20) - no reportable indications. Reinspection per BWRVIP-41 R3: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, & RS-7 (Jet Pumps 1 thru 6); IN-4, MX-2, & DF-1 (Jet Pumps 1 thru 5); no reportable indications. EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, & AD-3b (Jet Pumps 1 thru 10); linear indication (0.5 inches long) observed in heat-affected zone above the AD-1 weld for Jet Pump 6 was evaluated using Jet Pump Flaw Evaluation Handbook and was deemed acceptable. Otherwise, no reportable indications. EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. An additional indication was observed when a stain was reclassified; both indications were unchanged from U1R8, however. VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on five jet pumps (Jet Pumps 1, 10, 12, 17, & 18);

			significant increase in wedge wear for Jet Pump 6 necessitated a repair (aux wedge installed on the Shroud-Side Set Screw (SS-SS) for Jet Pump 6 to stabilize the restrainer bracket assembly); RS-8 and RS-9 welds for Jet Pump 6 examined (EXPANDED SCOPE) to insure no degradation was present - no recordable indications.
	2012	VT-1	VT-1 performed of Set Screw Locations AS-1 and AS-2 for Jet Pumps 1 thru 20. Backlighting identified three (3) set screw gaps (1 existing and 2 new) one of which (SS-SS for Jet Pump 18) measured at 9 mils and the other two (Vessel-Side Set Screw) VS-SS for Jet Pump 17 & SS-SS for Jet Pump 20) each measured at 20 mils, which exceeded the 15-mil screening criteria for installation of an auxiliary spring wedge but did not exceed the 20-mil criteria above which the potential exists for high level jet pump vibration. Gaps were corrected by tapping down on main wedge, so no additional auxiliary wedges installed. 17 set screw tack weld indications (11 existing and 6 new) were identified during U1R9. SS-SS on Jet Pump 17 was found backed out to shroud wall due to tack weld failure. SS-SS was restored to its original position and repaired (staked and an aux wedge added). Four additional set screws (Jet Pump 11 VS-SS, Jet Pump 13 SS-SS, Jet Pump 15 SS-SS, and Jet Pump 16 VS-SS) were found to have both tack welds broken and were staked and an aux wedge added. Remaining set screws had only 1 of 2 set screw tack welds and were acceptable as-is.
	2014	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on nine jet pumps (Jet Pumps 1, 6, 8, 9, 10, 12, 16, 17, & 18. Observed downward movement of the wedge for Jet Pumps 9

			& 12 led plant to conservatively inspect unrepaired adjusting set screws for both pumps – no reportable indications; minor wedge wear on all other jet pumps was unchanged. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery and six (6) auxiliary spring wedges installed during U1R9 (2012) were inspected to verify contact; no relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; indication was unchanged from U1R9 in 2012. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R9 in 2012.
	2016	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); indications of minor wear on nine jet pumps (Jet Pumps 1, 2, 5, 6, 9, 10, 12, 16, & 17). Adjusting set screws (AS-1 and AS-2) for five jet of the pumps (1, 2, 6, 9, & 10) conservatively added to scope to ensure no vibration-related damage was occurring; no set screw gaps nor new tack weld cracking observed; no slip joint clamps were required to be installed.

			3gaps observed during last set screw gap inspection during U1R9 were reinspected (Jet Pump 17, VS-SS - no gap observed; Jet Pump 18, SS-SS - no gap observed; Jet Pump 20, SS-SS - 13-mil gap); no aux wedges were required to be installed. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Four (4) auxiliary spring wedges inspected as part of expanded scope had relevant indications, so all 15 aux wedges installed on Unit 1 were inspected. 14 of 15 wedges had minor wear but none was judged serious enough to prevent wedges from performing their design function.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed during U1R9 & U1R10 in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; after cleaning the indication was re-identified as a scratch. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R10 in 2014 and upon evaluation were determined to be acceptable for one fuel cycle.
Jet Pump Diffuser	N/A	N/A	Diffuser exams reported in above jet pump assembly inspection results.

CRD Guide Tube	2005	EVT-1, VT-3	Baseline per BWRVIP-47: 19 control rod guide tubes (10% of total) examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual examination of Locations CRGT-2 and CRGT-3; no reportable indications.
CRD Stub Tube	2005	VT-3	VT-3 examinations performed for accessible areas for 145 stub tubes at various core locations. No damage or distortion was noted.
In-Core Housing	N/A	N/A	N/A
Dry Tube	2006	VT	All twelve (12) SRM/IRM dry tubes replaced with modified design which is resistant to cracking. Inspections will be scheduled after dry tubes have reached the expected 20-year life (2027).
Instrument Penetrations	2007	VT-2	Visual leak check is performed during Unit Startup. No reportable indications reported.
	2008	VT-2	Visual leak check performed during Unit Startup. Leak observed in safe-end to pipe weld for N11B instrumentation nozzle was repaired with weld overlay.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2014	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.

		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
			Visual leak check performed during Unit Startup. No relevant indications reported.
Feedwater Sparger	2005	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications.
			VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2008	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2010	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor impact damage observed on 175° Bracket (acceptable as-is), but otherwise no relevant indications were observed (no pin wear).
	2012	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor wear observed under the retaining pin for the end bracket at one new location (55°) when compared to U1R8 (2010) inspection results. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R10 in 2014 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of

			any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R8.
	2014	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications.
		VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R11 in 2016 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R9 in 2012.
	2016	VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R12 in 2018 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R10 in 2014.
Vessel ID Brackets	2005	EVT-1	Jet Pump Riser Brace Welds (40) examined (EVT-1): No recordable indications.

			Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): Damage to upper right corner and an indication extending from the damaged corner of the dryer support bracket located at 274° was repaired during Unit Recovery. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications.
	2012	EVT-1	Jet Pump Riser Brace Welds (12, Jet Pumps 1-6) examined (EVT-1): No recordable indications.
	2014	EVT-1	Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications.
	2016	EVT-1	Jet Pump Riser Brace Welds (Jet Pumps 7-20) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): No recordable indications. Attachment weld at 184° only received a VT-3 examination due to heavy crud buildup and will be cleaned and inspected to the proper exam method during U1R12 in 2018. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications. Guide Rod RPV Attachment at 0°: Indication on tack weld at the upper guide bracket to the Guide rod observed during Section XI Code examination.
LPCI Coupling	N/A	N/A	Not applicable to this plant

Steam Dryer	2005	VT-1	Full baseline inspection performed in accordance with BWRVIP-139 and GE SIL 644 R1. Three Drain Channel Vertical Welds were found to have indications, and were repaired with weld overlays.
	2008	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were VT-1 visually examined and confirmed. No change in condition was noted from what was previously reported. General visual inspection (pre-EPU baseline) performed in accordance with BWRVIP-139 and GE SIL No. 644 R1; no relevant indications were observed.
	2008	VT-1	In preparation for ascension to EPU and operation at EPU conditions, various steam dryer modifications were performed. All thirteen (13) Steam Dryer Tie-Bars were replaced with a new design and three (3) additional steam dam gussets on each steam dam were added to the Steam Dryer. A visual (VT-1) inspection was performed to document the as-left condition.
	2010	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R7.
	2012	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R8. Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed

			condition; no relevant indications were observed.
	2014	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R9 (2012).
	2016	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R10 (2014). Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed condition; no relevant indications were observed. Four (4) BWRVIP-139-A "Red Welds" (welds associated with dryer integrity) were visually inspected (VT-1). Three of the welds were found to have been removed during U1R7 modifications, the fourth had no relevant indications when examined.
Steam Separator	2010	VT-3	Steam Separator tie bars (cross bracing) examined for signs of cracking (Reference: INPO OE 30657). No relevant indications were observed on the cross bracing, but a minor dent was recorded at the top of a standpipe located in the southeast corner of the separator that was acceptable as-is.
DM Welds - BWRVIP-75-A Cat. C	2008	UT	3 welds inspected (RCRD-1-33, CS-1-002-008, CS-1-002-033A): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).

	2012	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R10).
	2016	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R11).
DM Welds - BWRVIP-75-A Cat. D	2008	UT	2 welds inspected (DRHR-1-2, DRHR-1-11): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).
	2012	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 10 (U1R10).
	2016	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 11 (U1R11).

Reactor Internals Inspection History

Plant: **Cooper Nuclear Station**

Component in BWRVIP Scope	Date of Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud	Fall 1995 (RE15)	UT	Baseline UT performed on welds H1 through H7 per BWRVIP guidelines. Indications identified in 4 circumferential welds. No examinations on vertical welds. No repair required.
	Spring 2005 (RE22)	UT	UT examinations were performed on welds H-1 through H-4 including a portion of vertical weld V16. Examination of welds H5-H7 was deferred to fall 2006. Single sided UT examinations were performed on welds H-1 through H-3 with welds H-4 and vertical weld (V-16) receiving dual sided examinations. Percentage of welds examined: H1 (54.9%), H2 (55.7%), H3 (63.9%), H4 (58.4%). The previously identified eight (8) flaws in H1 showed a net decrease in length. No new flaws in H2 were identified. The eight (8) flaws in H3 were reexamined with one (1) new flaw identified for a total increased change in flaw length relative to total weld length of 7.5 %. Two (2) new minor flaws were discovered in the HAZ of H4. In addition, a total of eleven (11) minor indications were identified in the base metal adjacent to H4. Six (6) of the indications exhibited characteristics associated with Stress Corrosion Cracking (SCC) in areas subjected to cold working during the shroud fabrication/installation process. The remaining five (5) indications did not exhibit characteristics of SCC but appeared to exhibit characteristics commonly observed from localized attachment removal sites. The indications were determined to be acceptable by analysis. No indications were observed in the vertical weld.

	Fall 2006 (RE23)	UT	UT examinations were performed on welds H5, H6a, H6b, and H7 using phased array. Two (2) sided examinations were performed on all welds except H7 that received a one-sided UT examination. Coverage was estimated at greater than 72% for welds H5, H6a, and H6b. H7 received greater than 53% coverage. A previously identified indication in H5 was re-examined with no apparent change. A previously identified indication in H6a was re-examined with no apparent change. A new minor indication was discovered in weld H6b in an area previously scanned in RE16 (1995). Two (2) new minor indications were discovered in weld H7, one in a previously scanned location and the other in an area not previously scanned.
		VT-3	VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Discovered an indication approximately ten (10) inches long behind JP-19. Analyzed as acceptable.
	Spring 2008 (RE24)	VT-3	Performed first ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Spring 2011 (RE26)	VT-3	Performed second ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Fall 2014 (RE28)	UT	UT exams were performed on the H1 thru H7 welds along with the V16 and base material flaw behind JP19. The previously identified indications showed no apparent changes in growth and none were through wall.
			VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Also performed third ASME B-N-2 VT-3 successive examination of flaw

			discovered in base metal behind JP-19. No changes in the indication.
Shroud Support/ Access Hole Covers	1993-1995	VT-3 and UT	VT-3 examinations of welds on 50% of core plate each outage. No indications. UT of access hole covers (AHC) in 1993. No indications.
	Spring 1997 (RE17)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC in accordance with GE SIL 462. No indications.
	Fall 1998 (RE18)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 of AHC's in accordance with GE SIL 462. No indications. VT-1 of gusset plate welds between 0-180° to B-N-2.
	Spring 2000 (RE19)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC's in accordance with GE SIL 462. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on 17% of the H8 and H9 welds. EVT-1 examinations on 6 gusset welds and AHC's. No indications.
		UT	UT examination of AHC's. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examinations on four (4) gusset welds. No indications.
	Spring 2005 (RE22)	UT	UT examinations on 11.7% of the H9 weld length. No indications
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations performed on approximately 16% of H8 weld length with no relevant indications. EVT-1 examinations of AHC per SIL462. No indications.

	Spring 2008 (RE24)	EVT-1	EVT-1 examinations performed on accessible lengths of welds on seven (7) gussets. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 examinations on 16.7% of the H8 weld. EVT-1 examinations on accessible lengths of welds on two (2) gussets @ 195° and 315°. No indications.
	Fall 2014 (RE28)	UT/EVT-1	UT performed on H9 with 13.4% coverage. EVT-1 performed on both AHC's. No indications.
Core Spray Piping	1980's to 1995	VT-1/VT-3	IEB 80-13 examinations of piping and welds in annulus. Three (3) indications identified in Fall 1995 outage by EVT-1. No repair required.
	Spring 1997 (RE17)	UT	UT examination of CS P8a and P8b welds. Indications on one P8a and P8b welds (first discovery). Evaluated as acceptable.
		EVT-1	EVT-1 examinations on balance of piping.
	Fall 1998 (RE18)	UT	UT examinations on the P8a and P8b indications were re-examined.
		EVT-1	Balance examined by EVT-1. No visual indications.
	Spring 2000 (RE19)	UT	UT examinations on P8a and P8b welds with indications. No repair required.
		EVT-1	EVT-1 of P3, P4, P5, P6, and P7 welds. No visual indications.
	Fall 2001(RE20)	UT	UT examinations on P3's, three (3) P4's, P5's, P6's, P7's, P8a's and P8b's. EVT examinations of thirty-one of the CS piping welds.
		EVT-1	EVT-1 examinations on fifteen (15) welds. Indications re-examined on P8a weld and P8b welds.
	Spring 2003 (RE21)	UT	UT examinations on all P8a and P8b welds. Identified three (3) flaw indications on one P8b weld and one (1)

			flaw indication on one P8a weld. No change in length.
		EVT-1	EVT-1 examinations on both junction box covers and accessible portions of both P1's, 2 - P2's, 4 - P3's, 1-P4a , 1-P4b, 1-P4c, 1-P4d. EVT-1 all P8a and P8b welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations of both P1's . The examination revealed that the P1 weld is not a creviced weld based on the presence of an external weld on the tee box near the nozzle thermal sleeve. EVT-1 examinations were performed on both P2 welds, the four (4) P3 welds, the 4a – 4d welds at 190° , the P5's, P6's, and P7's, the four (4) P8a's, and four (4) P8b's.
	Fall 2006 (RE23)	UT	UT examinations of P8b welds. Previous indications showed no change in size.
		EVT-1	EVT-1 examinations of piping welds and bracket attachment welds. No new relevant indications observed.
	Spring 2008 (RE24)	EVT-1	EVT-1 of indication near P1 at 90°. No change. EVT-1 of P1 at 270°. EVT-1 of P2's and P3's at 90° and 270°. EVT-1 of P4a, -b, -c, and -d at 170° EVT-1 of P5's, P6's, and P7's at 10°, 170°, 190°, and 350°.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations near P1welds at 90° and 270°. No change with the indication near the P1 at 90° (Loop A). EVT-1examinations of the four (4) P3, P5, P6 and P7 welds, EVT-1 examinations of downcomer welds P4a, P4b, P4c, and P4d at 10° . EVT-1 examinations of four (4) P8a and P8b welds. No change with visual indication of P8b at 10°.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.

	Spring 2011 (RE26)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° (Loop A). No change to the indication. EVT-1 of area adjacent to P1weld at 270°. No indications. EVT-1 of the P2 welds at 90° and 270°. EVT-1 of the four (4) P3, P5, P6, and P7 welds. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 190°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a, & P3b @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. No indications. EVT-1 of area adjacent to P1weld at 270° on B Loop,. No indications. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 350°. No indications. Loops A & B, EVT-1 of the bracket attachment welds PB @ 30°, 150°, 210°, and 330°. No indications.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.
	Fall 2014 (RE28)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a & P3b welds @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 170°. No indications observed.

			Loop B EVT-1 of area adjacent to P1weld at 270°. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. No indications observed.
	Fall 2016 (RE29)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 10°. No indications EVT-1 of two (2) P8a and two (2) P8b welds at 10° and 170°. No change with visual indication of P8b at 10°. Loop B EVT-1 of two (2) P8a and two (2) P8b welds at 190° and 350°. No indications.
Core Spray Sparger	1980's to 1995	VT-1/UT	IEB 80-13 of welds on sparger. No indications.
	Spring 1997 (RE17)	EVT-1	EVT-1 examinations of sparger welds and brackets per BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C identified. No other indications.
	Fall 1998 (RE18)	EVT-1	EVT-1 examinations of sparger welds and brackets inspected in accordance with BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C was reconfirmed. No other indications.
	Spring 2000 (RE19)	EVT-1	EVT-1 examinations of sparger and brackets. Five (5) indications evaluated as acceptable.
	Fall 2001 (RE20)	VT-1	VT-1 of 25% of S3a, S3b, and S3c welds. No indications.
		EVT-1	EVT-1 examinations of all S1, S2, and S4 welds examined with no indications.
	Spring 2003 (RE21)	VT-1	VT-1 of 25% of S3a & S3b's and all bracket welds. No indications.

		EVT-1	EVT-1 examinations of two S1,s, two S2,s, both XTRW welds near t-boxes, and four (4) S4 welds. No indications.
	Spring 2005 (RE22)	N/A	Sparger examinations deferred to fall 2006 (RE23).
	Fall 2006 (RE23)	VT-1	VT-1 on 50% of the S3a, S3b, and S3c welds and 100% on sparger brackets. No indications.
		EVT-1	EVT-1 on 100% of S1's and S2's and S4's. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 90°, 92°, 119°, 149°, 210°, 241° and 268°.
		EVT-1	EVT-1 examinations of S1's and S2's at 170° and 190°. EVT-1 examinations of S3a, S3b at 92° to 269°. EVT-1 examinations of S3c at 99°. EVT-1 examinations of S4's at 91° and 269°.
	Fall 2009 (RE25)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 272°, 299°, 30°, 329°, 61°, 88° and 270°.
		EVT-1	EVT-1 examinations of S1 and S2 and at 10° and 350°. EVT-1 examinations of two (2) additional welds near the 350° tee-box S2 welds.
	Spring 2011 (RE26)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications.
		EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4 @ 91° & 269°. No indications. EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4@ 91° & 269°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 on A sparger, S1 @ 10, S2 @ 8° & 12° and S4 @ 89° & 271°. No indications.

			EVT-1 on B sparger, S1 @ 350°, S2 @ 348° & 352°, XTRW welds near T-box @ 346° & 354°, and S4 @ 89° & 271°. No indications.
		VT-1	VT-1 on the B sparger, S3a & S3b @ 271°-89° and S3c @ 279°. No indications.
			VT-1 of the sparger brackets at 30.5°, 61°, 88°, 270°, 272°, 299°, and 329.5°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4@ 91° & 269°. No indications observed.
			EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4's@ 91° & 269°. No indications observed.
		VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets (SB) at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications observed.
Top Guide (Rim, etc.)	1991-1995	VT	VT of top guide beams of fifty (50) cells was performed in 1991 per RICSIL 059. No indications. VT exams of the members in the load path between the top guide and core shroud in 1995 per SIL 588. One (1) indication on the 90° aligner pin keeper was observed and evaluated as acceptable (indication not on load bearing portion of assembly).
	Spring 1997 (RE17)	VT -1	VT-1 re-examination of Top Guide Aligner Pin located at 90° in accordance with SIL 588, R1. Indication on aligner pin keeper did not appear to change in size.
	Spring 2000 (RE19)	VT -1	VT-1 of two (2) hold down assemblies. No indications.
	Fall 2001 (RE20)	VT -1	VT-1 of two (2) horizontal aligner pins with no new indications. VT-1 of four (4) hold down assemblies.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld.
	Fall 2006 (RE23)	VT-1	VT-1 on two (2) hold down assemblies and aligner pin assemblies at 90° and 270°. A previous indication identified on the non-load bearing keeper of the aligner pin assembly at the 90° location was observed with no apparent change. However, two (2) new but similar type indications were also observed on the same keeper. Three (3) new indications were observed on the non-load bearing aligner pin keeper at the 270° location. Indications were evaluated as acceptable.
		VT-3	VT-3 examinations performed on accessible areas of top guide per B-N-2. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 0 and 180°. One (1) new indication identified on non-structural keeper at 180°. Similar to indications in keepers seen at 90° and 270°. Evaluated as acceptable.
		EVT-1	EVT-1 examinations of accessible areas of Rim weld.
		VT-3	VT-3 examinations performed of accessible top guide hold down assemblies, rim pins per B-N-2.
	Fall 2009 (RE25)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 90°. No change in the indication at the 90° aligner pin keeper.
		EVT-1	EVT-1 examinations of 10% or fourteen (14) of top guide grid beams per BWRVIP-183. No indications. However, only eight (8) were credited as quality examinations.
		VT-3	VT-3 examinations of accessible areas of top guide per B-N-2.

	Spring 2011 (RE26)	VT-3	VT-3 of accessible areas of Top Guide per B-N-2. No indications.
		VT-1	VT-1 for BWRVIP-26 credit was performed on the Hold Down assemblies and Aligner Pin assemblies at 270°. An indication not previously reported was observed adjacent to the attachment weld adjoining the Aligner Block to the Top Guide. Indication appears to be a manufacturing remnant that was not completely removed during construction. Previously identified indications were also observed with no changes. Scope was expanded to include the remaining other three (3) Aligner Pin assemblies located at 0°, 90°, and 180°. VT-3 for Sect. XI B-N-2 and VT-1 for BWRVIP-26 credit was performed. Aligner Pin assembly at 0° was found to have seven (7) previously unidentified indications, with four (4) identified in the Aligner Pin Keeper and three (3) identified in the Aligner Block. Review of previous inspection video showed faint presence of indications. Evaluated as acceptable. Aligner Pin assembly at 90° was found to have one (1) previously unidentified indication located on the Aligner Pin Keeper. Review of previous inspection video showed a faint presence of the indication. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable. Aligner Pin assembly at 180° was found to have two (2) previously unidentified indications located on the Aligner Pin Keeper. Review of previous inspection video shows presents of indications. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld. EVT-1 of two (2) top guide cell locations per BWRVIP-183. No indications.
	Fall 2012 (RE27)	VT-1	VT-1 examinations performed on hold down assembly at 180°. No indications.
		VT-1	VT-1 of the aligner pin assembly at 0° was performed to confirm seven (7) flaws identified in RE26. Four (4) of the flaws on the keeper were confirmed and verified to have no changes. One (1) flaw on the aligner pin block was confirmed and verified to have no changes. The two (2) other previously identified flaws on the block were determined to be non-relevant surface scratches. VT-1 of the aligner pin assembly at 90° was performed to confirm seven (7) flaws identified on the keeper in RE26. 4 of the flaws were confirmed and verified to have no changes. One (1) additional flaw on the keeper was also reported. This flaw is similar to flaws seen on the other aligner pin keepers, but could not be verified in previous video due to camera positioning. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) flaws identified in RE26. All of the flaws on the keeper were confirmed and verified to have no changes. VT-1 of the aligner pin assembly at 270° was performed to confirm four (4) flaws identified in RE26. Three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) previously reported flaw adjacent the aligner block to top guide weld was examined using an improved camera and delivery mechanism and determined to be a non-relevant surface scratch.
	Fall 2014 (RE28)	EVT-1	EVT-1 examinations of accessible areas of Rim weld. No indications

		VT-1	VT-1 examinations performed on accessible top portion of the TG hold down assembly at 0°. No indications. VT-1 of the aligner pin assembly at 0° was performed to confirm five (5) previously identified flaws. Four (4) flaws on the keeper were confirmed to have no changes. The identified flaw on the aligner pin block showed slight increase in length. VT-1 of the aligner pin assembly at 90° was performed to confirm five (5) previously identified flaws. The 5 flaws on the keeper were confirmed to have no changes. Five (5) unreported flaws on the aligner block were detected. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) previously identified flaws. The three flaws on the Keeper were confirmed to have no change. Five (5) unreported flaws on the aligner block and two (2) on the top guide were detected. VT-1 of the aligner pin assembly at 270° was performed to confirm three (3) previously identified flaws. The three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) unreported flaw on the aligner block and one (1) on the top guide were detected.
		EVT-1	EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No crack indications identified.
	Fall 2016 (RE29)	EVT-1	EVT-1of five (5) of top guide grid beams per BWRVIP-183. No indications. EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No indications identified.

		VT-1	VT-1 of accessible top portion of the TG hold down assembly at 90°. No indications.
		VT-1/ EVT-1	VT-1 and EVT-1 of aligner pin assembly at 0° confirmed five (5) previously identified flaws. All flaws showed no changes, except for Flaw 6 on the keeper which appeared longer compared to previous examination but difference was attributed to improved tooling and lighting.. VT-1 and EVT-1 of aligner pin assembly at 90° confirmed ten (10) previously identified flaws on the keeper and block. All flaws showed no changes except for, Flaw 5 (keeper) and 10 (block) which appeared longer compared to previous exam with difference attributed to improved tooling an lighting. VT-1 and EVT-1 of aligner pin assembly at 180° confirmed nine (9) previously identified flaws. All flaws showed no changes, except for Flaws 2 and 3 on keeper which appear longer compared to previous exam with difference attributed to improved tooling and lighting. One (1) new flaw was reported on the block to slider weld that was later confirmed to be present in the previous exam. Change attributed to improved tooling and lighting. VT-1 and EVT-1 of aligner pin assembly at 270° confirmed five (5) previously identified flaws that showed no changes. One (1) new flaw reported on keeper to washer weld that was later confirmed to be present in the previous exam.
Core Plate (Rim, etc.)	Fall 1995	VT-3	VT-3 examinations of Hold down bolts examined in 1995 per SIL 588. No indications.
	Spring 2000 (RE19)	VT -3*	VT-3 examinations of 48 bolts examined from top side. *(Bolts are not accessible for EVT-1)

	Fall 2001 to Fall 2009 (RE20 – RE26)	VT-3	VT-3 examinations performed on accessible areas per B-N-2. No indications.
	Fall 2012 (RE27)	VT-3	VT-3 examination of three (3) hold down bolt locations (70, 71, and 72) from the top side. No indications.
	Fall 2014 (RE28)	VT-3	VT-3 exam of 36 (50%) hold down bolt locations from the top side. No indications.
SLC	1986-2001	VT-2	VT-2 examinations of SLC penetration during Class 1 RPV pressure test each outage.
	Spring 2003 (RE23)	EVT-2	Enhanced VT-2 examinations during Class 1 pressure test. No indications.
	Spring 2005 (RE22)	EVT-2/UT	Enhanced VT-2 performed of safe-end and penetration in conjunction with ASME Section XI Class I pressure test. Manual UT to Appendix VIII performed on nozzle to safe-end weld. No indications.
	Fall 2006 (R23)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2008 (RE24)	EVT-2	Enhanced VT-2 examinations performed of safe-end and penetration in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2009 (RE25)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2011 (RE26)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.

	Fall 2012 (RE27)	UT	UT examination of N10 SLC nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2014 (RE28)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
Jet Pump Assembly	1986-1995	VT-1/VT-3 /UT	VT examinations on ten (10) Jet Pumps each outage. Exam includes applicable GE SILS. Jet pump beams replaced in 1985. Jet pump beam UT first performed in 1993.
	Spring 1997 (RE17)	VT-1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Examinations deferred to Fall 2001.
	Fall 2001 (RE20)	VT-3	VT-3 examinations on all 20 jet pump nozzle inlets per SIL 465. No indications.
		VT-1	VT-1 examinations on all WD-1's. No indications.
		EVT-1	EVT-1 examinations on BB-1 and BB-2 on JP's 1-10. EVT-1 on MX-2's on JP's 1 – 10. EVT-1 on RB-1's and RB-2's on JP's 1/2, 3/4, and 5/6. No indications. EVT-1 on RS-1's, RS-2's, and RS-3's on JP's 1 – 10. EVT-1 on RS-6's on JP's 1, 3, and 5. EVT-1 on RS-7's on JP's 2, 4, and 6. EVT-1 on RS-8's and RS-9's on JP's 1/2, 3/4, and 5/6. No indications.
	Spring 2003 (RE21)	VT-3	VT-3 examinations on the JP nozzle inlet mixers on JP's 11 - 20 per SIL 465. VT-3 examinations of set screws, gaps, and tack

			welds on JP's 1 – 20 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on the IN-4 on JP's 5, 6, 11, 12, 13, and 14. EVT-1 examinations on the MX-2 on JP's 11, 12, 13, and 14. EVT-1 examinations on the RB-1's and RB-2's, on JP's 11/12 and 13/14. EVT-1 examinations on RS-1 and RS-2 on JP's 11/12, 13/14, 15/16, and 17/18; RS-6 on JP's 11 and 13; RS-7's on JP's 12 and 14; RS-8's and RS-9's on JP's 11/12, 13/14. No indications.
		UT	UT examinations on the BB-1's and BB-2's for JP's 1 – 20. No indications.
	Spring 2005 (RE22	VT-3	VT-3 on the JP nozzle inlet mixers on JP s 1 – 10 per SIL 465. No indications.
		VT-1	VT-1 examinations on JP set screws, gaps and tack welds on JP's 1, 2, 15, and 16 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on RS-1, RS-2, and RS-3 welds on JP's 1 and 2 and the IN-4 welds on JP's 7, 8, 9, and 10. No indications.
	Fall 2006 (RE23)	VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 9, 10. VT-1 of WD-1 at JP's 9, 10. No indications.
		EVT-1	EVT-1 of RS-1 and RS-2 on JP's 15/16 and 19/20.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of IN-4's at JP's 19 and 20. EVT-1 examinations of RB-1a's, -1b's, -1c's, and -1d's between JP's 9/10 and 19/20. EVT-1 examinations of RB-2a's, -2b's, -2c's, and -2d's between JP's 9/10 and 19/20. EVT-1 examination of RS-3 between JP's 19/20. EVT-1 examinations of RS-6 at JP's 9 and 19. EVT-1 examination of RS-7 at JP's 10 and 20. EVT-1 examinations of RS-8 and RS-9 at JP's 19/20 and 9/10. No indications.

		UT	UT of BB-1, -2 and -3 on all 20 JP beams. No indications. UT of MX-2 (and AD-1, AD-2, DF-1, DF-2, DF-3 note in Diffuser Section) on all 20 jet pumps.
	Fall 2009 (RE25)	VT-3	VT-3 of JP nozzle inlets per SIL465 on JP's 15, 16, 17 and 18. No indications.
		VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 10. 15, 16, 19, and 20. VT-1 of WD-1 at JP's 17, and 18. No indications.
		EVT-1	EVT-1 examinations of IN-4 on JP's 15, 16, 17, and 18. EVT-1examinations of RB-1's and RB-2's on JP's 7/8, 15/16, and 17/18. EVT-1 examinations on RS-1's and RS-2's on JP's 11/12 and 17/18. EVT-1examinations on RS-3's on JP's 11/12, 15/16, and 17/18. EVT-1 examinations on RS-6's on JP's 7, 15, and 17 and RS-7's on JP's 8, 16, and 18. EVT-1 examinations on RS-8's and RS-9's on JP's 7/8, 15/16, and 17/18. No indications.
	Spring 2011 (RE26)	VT-3	VT-3 of JP nozzle inlets on JP 9 and 10. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed.
		EVT-1	EVT-1 of RS-8 and RS-9 on JP-1 thru JP-14, JP-19, and JP-20. No indications.
			EVT-1 of JP-9 and JP-10's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-3, RS-1, RS-2. EVT-1 of JP-9's RS-6 and JP-10's RS-7. No indications.
			EVT-1 of JP-7 and JP-8's RS-3. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of JP-13 and JP-14's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, & RS-3.

			EVT-1 of RS-6 on JP-13 and RS-7 on JP-14. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications. EVT-1 of JP-15 and 16's RS-3. No Indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1, 2, 9, 10, 13, 14, 15, 16, 19, & 20. No indications of movement or wear observed. VT-1 of the JP-15 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of 0.003" with no signs of movement. Vessel side set screw confirmed to have partial contact. No indications on slip joint. VT-1 of the JP-20 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of .004" with no signs of movement. Newly reported Vessel side set screw gap measured to be .013". No indications on slip joint.
		VT-3	VT-3 of JP nozzle inlets on JP-13 and 14. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of MX-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 of JP-1 and JP-2's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6 on JP-1 and RS-7 on JP-2. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed. VT-1 of the set screws and auxiliary wedges on Jet Pump 1, 2, 9, &10. JP10 had a previously identified shroud side gap that was found to be 0.011" with no

			signs of movement. JPs 1, 2, and 9 set screws and aux wedges were found to be in full contact with no signs of wear.
		VT-3	VT-3 of JP nozzle inlets on JP-1 and 2. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of MX-2 and IN-4 on JP-6. No Indications.
			EVT-1 of RS-1, RS-2, and RS-3 on JP-3&JP-4 and RS-1 and RS-2 on JP-7&JP-8. No Indications
			EVT-1 of JP-5&JP-6's RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, and RS-9. No Indications.
		VT-1	VT-1 of set screw gaps and slip joints on JP-15 and JP-20. No Indications.
			VT-1 of the JP Restrainer Wedge (WD-1) at JP-5 and JP-6. No indications.
		VT-3	VT-3 of JP nozzle inlets on JP-6. No indications.
Jet Pump Diffuser	1986-1998	VT -3	10 Jet Pumps VT-3 examined each outage. No indications. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT-1/VT-3	VT examinations on ten (10) jet pumps. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Exams deferred to Fall 2001.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on ten (10) jet pumps (5 assemblies). Identified an indication thought to be a broken jet pump sensing line upper bracket retaining weld. Evaluated as acceptable.

	Spring 2003 (RE21)	VT-3	VT-3 on JP sensing lines for all jet pumps per SIL 420. No indications.
		VT-1	VT-1 on sensing line brackets for all jet pumps per SIL 420. Previously reported cracked bracket weld was determined not to be cracked. No indications.
		EVT-1	EVT-1 examinations of AD-1, AD-2, AD-3a, AD-3b welds on JP's 11 through 20. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 on JP sensing lines for JP's 1 – 11 and 14 per SIL 420. No indications.
		VT-1	VT-1 on JP sensing line brackets for JP's 1- 11 and 14. No indications.
	Fall 2006 (RE23)	EVT-1	EVT- 1 on AD-1 on JP's 1, 2, and 5. EVT-1 examinations on AD-2, AD-3a, AD-3b, DF-1 on JP-15, 16, 17, 18, 19, and 20 and DF-2 on JP's 15, 16, 19, and 20. No indications.
	Spring 2008 (RE24)	UT	UT on AD-1, AD-2, DF-1, DF-2, and DF-3 (and MX-2). One (1) indication on DF-1 at JP-14.
		EVT-1	EVT-1 examinations on DF-1 at JP-14 in addition to UT. Appeared to be a defect from original construction.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of indication to DF-1 on JP-14 identified during the previous outage. No change.
	Spring 2011 (RE26)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication was found to have no changes.
	Fall 2012 (RE27)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication did not change.
	Fall 2014 (RE28)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-1, DF-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 re-examination of indication located on the inside surface of

			JP-14 at the DF-1 weld. Indication did not change.
	Fall 2016 (RE29)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-2 on Jet Pumps 3, 4, 5, 6, & 7. No indications. EVT-1 of DF-1 (outside diameter) on Jet Pumps 6 and 14. No Indications. EVT-1 of DF-1 (inside diameter) for re-examination of indication on the inside surface of JP-14. Indication showed no change.
CRD Guide Tube	Fall 1995	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 1997 (RE17)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Fall 1998 (RE18)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of eighteen (18) anti-rotation pins and eleven (11) CRGT-1 welds. No indications.
		EVT-1	EVT-1 examinations of four (4) CRGT-2 and CRGT-3 welds. No indications.
	Fall 2001 (RE20)	VT-3	VT-3 examinations of thirteen (13) anti-rotation pins and thirteen (13) CRGT-1 welds. No indications.
		EVT -1	EVT-1 examinations of five (5) CRGT-2 and CRGT-3 welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations on one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations of one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of two (2) CRGT-2 welds and three (3) CRGT-3welds. No indications.
		EVT-1	

	Fall 2009 (RE25)		EVT-1 examinations on one (1) CRGT-2 weld and two (2) CRGT-3welds. No indications.
CRD Stub Tube	N/A	N/A	No record of examination.
In-core Housing	NA	NA	No record of examination back to 1996
Dry Tube	1989-1991	VT	VT exam in 1989, 1990, and 1991 per SIL409R1. All dry tubes replaced in 1993.
	Spring 2005 (RE22)	VT	Replaced one (1) dry tube.
	Fall 2012 (RE27)	VT-1	VT-1 was performed on dry tube locations at 12-09 and 28-25. No indications.
	Fall 2014 (RE28)	VT-1	VT-1 performed on IRM dry tube locations at 20-25 and 36-41. No indication observed. Replaced IRM dry tube at 12-41.
	Fall 2016 (RE29)	VT-1	VT-1 on Dry Tube Locations. IRM 28-33 & 36-09 and SRM 12-33, 20-17, & 36-25. No Indications.
Instrument Penetrations	1986-2000	VT-2	VT-2 examination performed during RPV system leakage test each outage for all six (6) instrument nozzle penetrations. No indications.
	Spring 2000 (RE19)	PT	PT examination of N16A instrument penetration nozzle to safe-end weld.
	Fall 2001 (RE20)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2003 (RE21)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2005 (RE22)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
		UT	UT examination of N16 nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
	Fall 2006 (RE23)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.

	Spring 2008 (RE24)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2009 (RE25)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2011 (RE26)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2012 (RE27)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2014 (RE28)	UT	UT examination of N16B nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2016 (RE29)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
Vessel ID Brackets	1986-1995	VT -1/VT-3	ASME XI VT-3 (non-beltline) and VT-1 (beltline examinations) of jet pump riser brace, dryer, FW Sparger, Core Spray, guide rod, and surveillance capsule holder brackets performed once per interval. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
		EVT-1	EVT-1 examinations on four (4) CS bracket attachment welds. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of guide rod attachment welds. No indications.
		VT-1	VT-1 on FW sparger brackets. No indications.

		EVT-1	EVT-1 examinations on CS bracket attachment welds. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on all FW sparger bracket attachment welds and all dryer support attachment welds. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examination of on JP riser brace pad attachment weld at 150°. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 examination of steam dryer hold down brackets.
	Fall 2006 (RE23)	EVT-1	EVT-1 of eight (8) FW sparger brackets and four (4) CS piping bracket attachment welds. No indications.
	Spring 2008 (RE24)	VT-3	VT-3 of guide rod attachment welds. No indications.
		EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 30°, 150°, 210°, 270°, and 330°. EVT-1 examinations of steam dryer support bracket attachment welds at 215° and 325°. No indications.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 60°, 90°, and 120°. No indications.
	Spring 2011 (RE26)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 30°. No Indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of four (4) CS piping bracket attachment welds at 30°, 150°, 210°, and 330°. No indications. EVT-1/VT-1 of JP riser brace pad attachment welds at 270°. No indications. EVT-1/VT-3 of steam dryer support bracket attachment welds at 215° and 325°. No indications.

		VT-1	VT-1 of surveillance capsule holder brackets at 300°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of Riser Brace attachment welds on JP-1 & 2 at 150°. No indications.
		EVT-1/ VT-3	EVT-1/VT-3 of steam dryer support bracket attachment welds at 145° and 35°. No indications.
		VT-1	VT-1 of surveillance capsule holder brackets at 30° & 120°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 90°. No Indications.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	Fall 2001 (RE20)	VT-1	VT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2003 (RE21)	EVT-1	EVT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2005 (RE22)	VT-1	VT-1 of leveling screws per OE 16110
	Fall 2006 (RE23)	VT-1 w/Character Card	Performed baseline VT-1 examinations to BWRVIP-139 and SIL 644, Rev 2. Re-examined five (5) minor indications previously identified per SIL 474 adjacent to several drain channels. Two (2) new indications were observed in a weld adjacent to a drain channel and both tack welds on one (1) lifting lug were observed. The indications were evaluated as acceptable.
	Fall 2009 (RE25)	VT-1 (89)	VT-1 examinations on seven (7) previously identified indications on dryer. With additional cleaning, six (6) of the

			indications disappeared with only one (1) remaining (i.e., the cracked tack welds on one (1) lifting lug - no change in the lifting lug).
	Fall 2016 (RE29)	VT-1 (89)	Performed VT-1 examinations to BWRVIP-139-A. Re-examined one (1) previous indication of cracked tack welds on lifting lug @ 145° with no changes. The other three (3) lifting lugs were observed to have similar cracked tacks that were not previously reported. Five (5) Tie Rods were reported to be slightly bent with no broken welds. One (1) additional indication was observed on the lower guide bracket weld at 180° that extended into the skirt. The indication was arrested with a 5/8th inch Stop-drill hole. No other dryer indications reported.
Dissimilar metal welds	Spring 2008 (RE24)	UT	Automated UT performed on four (4) CAT A welds per Appendix VIII. Manual UT performed on two (2) CAT A welds. All welds included in Risk-Informed ISI Program. No indications.
	Spring 2011 (RE26)	UT	Manual UT inspection performed on one (1) CAT D nozzle to cap weld (CRD Return) per Appendix VIII and Risk-Informed ISI Program. No indications.
	Fall 2014 (RE28)	UT	Manual UT inspection performed on three (3). CAT A welds per Appendix VIII. All welds included in Risk-Informed ISI Program. No indications.
	Fall 2016 (RE29)	UT	Automated Phased Array UT performed on one (1) CAT D weld and manual UT performed on one (1) CAT A weld. Both welds included in Risk-Informed ISI Program. No indications.

Reactor Internals Inspection History

Plant: **Dresden 3**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Spray Piping	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of piping and welds in annulus. Indications observed at two lower elbow to pipe welds 2P4c and 4P4c. These welds were repaired using GE designed clamps.
	4/97-R14	UT/EVT-1	UT Baseline inspections per BWRVIP-18 of all piping circ welds in annulus. Repairs removed and not reinstalled. EVT-1 of any piping welds in annulus inaccessible to scanner. Additional flaws identified on 1, 2 and 3P8a welds.
	2/99-R15	EVT-1	EVT-1 examined undemonstrated welds P8a and P4d on all four downcomers. Installed a "bumper" repair on 1P8a at the 80° downcomer.
	9/00-R16	UT/EVT-1	UT of "Target" welds and EVT-1 of all undemonstrated welds. Also EVT-1 of welds made inaccessible from repair installed on the 80° downcomer including 1P7, 1P4c, 1P4d, 1P8a and b. Welds 2P4c and 4P4c exhibited flaw growth as predicted by Flaw Evaluation.
	10/02-R17	VT-1	Six P4 welds for presence of "excessive grinding". NRI. All undemonstrated welds P8a and P4d and long seams on thermal collars, NRI
	10/04 – R18	EVT-1	Examined piping welds 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b. Eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		NA	Performed Core Spray Lower Sectional Replacement (all four downcomers) eliminating welds 1-4P4c, 1-4P4d, 1-4P8a, 1-4P8b, 1-4P5, 1-4P6, and 1-4P7.
	11/06 – R19	VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of all accessible bolting, keepers, ratchets and latch springs. NRI - VT-3 of all repair hardware. NRI

		EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
	11/08 – R20	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 4P4a, 4P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI
	11/10 – R21	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI.
		VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of 4 bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/12 – R22	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 1P4a, 1P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. One RI due to partially cracked tack weld.
	11/14 – R23	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for two piping brackets. RIs on both brackets due to partially cracked tack welds.
		VT-1/VT-3	Core Spray Lower Sectional Replacements (all four lines) - VT-1 of bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/16 – R24	EVT-1	Examined piping welds: 1P1, 2P1, 2P2, 2P3, 3P3, 4P4a, 4P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for three piping brackets. RIs on two brackets due to partially cracked tack welds.

Core Spray Sparger	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of spargers and tee-boxes. NRI.
	4/97-R14	EVT-1, VT-3	Examined tee-box cover plate welds (S1), tee-box to sparger arms (S2), and sparger end caps (S4) to EVT-1. NRI. Examined sparger nozzles (S3) and the sparger piping to VT-3. NRI.
	10/00 - R16	EVT-1, VT-3	Per BWRVIP-18: EVT-1 of all S1, S2 and S4. VT-1 of 50% of S3. NRI.
	10/04 – R18	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			-All 12 sparger brackets and bracket to shroud welds. NRI. -Core Spray Lower Sectional Replacement (all four downcomers) eliminating inspection of the following welds: 1-4S1, 1-4S2a-b.
	11/08 – R20	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 1S3 (007-080°), 1S3 (080-183°), 2S3 (007-110°), 2S3 (110-183°). NRI.
			All 12 sparger brackets and bracket to shroud welds. One relevant indication identified. Indication acceptable for one cycle of operation.
	11/10 – R21	VT-1	One sparger bracket to shroud weld which had a previous indication identified in R20. No identified change. Indication acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			All 12 sparger brackets and bracket to shroud welds. No change observed on previously identified relevant indication.
	11/14 – R23	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.

	11/16 – R24	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.
Attachment Welds	4/94-R13	VT-1	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. NRI.
	10/00-R16	VT-1	ASME Section XI B-N-2, surveillance capsule holder attachments in beltline. All six sets examined. NRI.
	10/02 - R17	EVT-1	BWRVIP-48 attachments: four dryer lugs, eight feedwater sparger end-brackets, eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI
	10/04 – R18	EVT-1	Four steam dryer wall support lugs, lug to pad, and pad to vessel attachment welds. Eight feedwater sparger lug to vessel attachment welds. NRI.
		VT-1	Eight feedwater sparger end-bracket lug assemblies. NRI
	11/06 – R19	VT-3	Examined attachment welds for two Core Spray piping brackets and all four steam dryer wall support lugs in accordance with ASME Section XI. NRI
		EVT-1	Inspected piping bracket to piping weld and bracket to vessel attachment weld on 2 core spray piping brackets. NRI
	11/08 – R20	EVT-1 and VT-3	- Examined attachment welds for two Core Spray piping brackets. NRI - Examined surveillance capsule holder bracket attachment welds. NRI
		VT-3	Examined steam dryer and steam separator guide rod attachment welds. NRI
	11/10 – R21	EVT-1	Examined attachment welds for two Core Spray piping brackets and two steam dryer wall support lugs. NRI
	11/12 – R22	EVT-1	Examined attachment welds for all 8 feedwater sparger end bracket attachment welds. NRI
	11/14 – R23	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI
	11/16 – R24	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI

Core Shroud	4/94-R13	EVT-1 and UT	Inspections per SIL 572, extensive indications in circumferential welds.
	4/97-R14	EVT-1 and UT	Inspected all shroud repair design reliant structure prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspections consisted of EVT-1 of all ring segment welds (accessible surfaces), UT for minimum ligament of all vertical welds accessible to scanner and EVT-1 for minimum ligament on all accessible surfaces of all vertical welds not accessible to the scanner.
		NA	Installed four tie-rod shroud repair assemblies and four core plate wedges.
	2/99-R15	VT-1	Examined all four tie-rod assemblies and core plate wedges at locations specified by the manufacturer (GE).
	10/00-R16	UT	Examined a 40° segment of H4 to assist in shroud qualification of Core Spray Repair. NRI.
	10/04 – R18	EVT-1	Examined Ring Segment Welds V1-V4 (Shroud Head RSWs), V8-V13 (Top Guide RSWs), and V20-V25 (Core Plate Support RSWs). Historical indications at V23 and V25 revealed no apparent change since last inspection in R14 (indications are not in HAZ. All other RSWs NRI.
	11/06 – R19	UT	GE utilized the Telescoping Shroud Scanner to perform UT on Shroud vertical welds V5-V6, V14-V19, V26-V28. Coverage obtained as follows: V5 – 80.4% V6 – 34.8% V14 – 66.8% V15 – 75.6% V16 – 80.4% V17 – 77.9% V18 – 95.5% V19 – 69.8% V26 – 13.7% V27 – 69.4% V28 – 57.6% One indication identified on V27 (1.8" in length). Indication acceptable for continued operation in accordance with BWRVIP-76.

		EVT-1	Performed one-sided EVT-1 examinations on vertical welds. NRI. Coverage as follows: V7 – 40% V29 – 40% (between H7 and H8 welds) V30 – 0% (between H7 and H8 welds) V31 – 30% (between H7 and H8 welds) V32 – 0% (between H7 and H8 welds)
		VT-3, EVT-1	Performed GE recommended inspections of shroud repair hardware. Scope included inspections to address susceptible areas based on indications found at Hatch. One RI identified due to retainer clip not engage. This retainer clip is redundant and did not require repair.
	11/08 – R20	EVT-1	Examined historical indications at V23 and V25. No apparent change from previous inspection.
	11/10 – R21	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V1, V2, V3, V4, V8, V9, V10, V11, V12, V13, V20, V21, V22, and V24. Horizontal indications were identified in the top guide ring below H2, near V12 and V13. Indications acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V7, V29, V30, V31 and V32. Inspected previous indications V12, V13, V23 and V25. Indications evaluated as acceptable.
		EVT-1&VT-1	Inspected shroud repair hardware and core plate wedges at all four azimuths. RI-minor wear noted.
	11/14 – R23	EVT-1	- Inspected previous indications V12 and V13 with no change observed. - Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
	11/16 – R24	UT	Inspected shroud vertical welds V5-V6, V14-V19, V26-V28. One indication identified on V27 (1.8" in length). Indication acceptable in accordance with BWRVIP-76.
		EVT-1	- Inspected vertical ring welds V1-V4, V8-V13 and V20-V25. Indications noted on V12, V13, V21, V22, V23 and V25. Indications evaluated as acceptable. - Inspected shroud vertical weld V7. NRI

		VT-3	- Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
Shroud Support	4/94-R13	UT/VT-1	Access hole cover VT/UT for circ and radial flaws. NRI.
	4/97-R14	EVT-1	Examined H8 and H9 for about 12" at 4 locations of shroud repair hardware attachment areas. NRI.
	2/99-R15	EVT-1	Per BWRVIP-38: Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI. Requirements for this inspection cycle are satisfied. NRI.
	10/02- R17	EVT-1	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	10/04 – R18	EVT-1	Examined H8 and H9 between Jet Pumps 10 and 11 (132°-177°). NRI
	11/06 – R19	EVT-1, VT-3	VT-3 of accessible areas of H9 and EVT-1 of 10% of H9 (between Jet Pumps 10 and 11). NRI.
	11/08 – R20	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI.
	11/10 – R21	UT	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	11/12 – R22	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°) and Jet Pumps 10 and 11 (132°-177°). NRI.
SLC	10/02 - R17	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/06 – R19	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/10 – R21	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/14 – R23	UT	UT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
Jet Pump Assembly	4/94-R13	VT-1	Hold down beams, beam bolt keepers, lockplates 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. Prior to R13, visually inspect 100% of upper areas of each Jet Pump including beam retainers every other outage.

	4/94-R13	VT-1	Riser brace arm to yoke welds on three upper (secondary) riser braces found cracked. Repairs are not required. No other reportable indications.
			Diffuser to baffle plate welds on all twenty jet pumps. NRI.
	4/97-R14	EVT-1	All ten RS-1, 2, 3, 4 and RS-5. NRI.
	2/99-R15	EVT-1	Initiate BWRVIP-41: Medium Priority: 50% of DF-1, MX-1, MX-3 and IN-5 welds. All twenty RB-1, 2, RS-8 and RS-9. NRI. High Priority: 50% of DF-2, AD-1, 2 and 3. NRI.
		VT-1	Examined all twenty WD-1 locations. NRI.
	10/02-R17	EVT-1	Repeat examination of four DF-2 welds to improve coverage. NRI.
			Five RS-9 and 10 riser to secondary brace yoke welds, NRI. Eleven secondary brace RB-3 welds per ASME XI and BWRVIP-48. NRI.
	03/03-D3M09	VT-1	Verified acceptable restrainer set-screw gaps when replaced beams (reference Jet Pump Beams section of this report). Aux wedges installed two set-screw locations. The other locations were NRI.
	10/04 – R18	VT-1	Examined jet pump sensing line clamps on jet pumps 1, 2, 3, 10, 11, 12, 13, & 20.
		EVT-1	Examined all twenty WD-1 locations. Noted normal movement of wedges 11 & 20 with no abnormal wear. All other wedges NRI.
			Examined AS-1 (set-screw gaps) on five jet pumps: 8 (Vessel Side, Shroud Side), 9 (VS, SS), 11 (SS), 12 (VS, SS), 20 (VS, SS). No unacceptable gaps were identified (all less than 0.010").

			Examined AS-2 (set-screw tack welds) on five jet pumps: 8 (VS, SS), 9 (VS,SS), 11 (SS), 12 (VS, SS), 20 (VS,SS). Lack of fusion of tack welds was identified on jet pumps and set screws: 9 (VS), 11 (SS), & 13 (VS). Indications noted on the tack welds for 9 and 13 were accepted as-is for one-cycle. Jet pump 11 had a set screw missing from its housing. The set-screw was retrieved and an auxiliary wedge was installed. Also discovered during the inspection of jet pump 11 was a poor quality tack weld on the swing-gate keeper. The condition of the bolt keeper was accepted for one cycle.
			The auxiliary wedge installed during D3M09 on jet pump 13 was examined and historical cracking was re-identified on the set-screw mounting block. This indication is historical and was caused by the ejection of the inlet-mixer following the failure of a beam-bolt. The indication has been accepted as-is. Also discovered on jet pump 13 was a gap between the vessel side restrainer bracket and the swing gate. The condition of the bracket and swing gate was accepted for one cycle.
			Examined RS-10 & -11 on jet pumps: 2, 3, 4, 12, & 13. NRI. Examined RS-1, 2, & 3 on five jet pump pairs: 1/2, 3/4, 9/10, 11/12, 13/14. NRI.
		UT	Examined MX-3a&b, DF-1, -2 & -3 and AD-1, -2 on jet pumps: 2, 3, 4, 5, 8, 9, 12, 13, 18, & 19. NRI.
	11/06 – R19	EVT-1	Examined RB-1 & 2 on jet pumps: 1, 2, 3, 4, & 20. NRI Examined RS-4 & 5 on jet pump pairs: 9/10, 11/12, 13/14. NRI Examined RS-8 & 9 on jet pump pairs: 1/2, 3/4, 5/6. NRI Examined MX-1 and IN-5 on jet pumps: 1, 2, 3, 4, 5, 11, 12, 13, 14, and 15. NRI
		VT-1	Examined aux wedge on JP 11. RI for slight wear on JP 11 aux wedge. Justified continued operation for one cycle. Examined main wedge WD-1 on JPs 1, 2, 3, 4, and 11 for wedge wear. NRI.

		NA	- Installed new ratchet style swing gate on JP 11 to address degraded keeper tack weld identified in R18. - Staked threads due to cracked tack welds (found in D3R18) and installed aux wedges on JP 9 vessel side and JP 13 vessel side set screws.
	11/08 – R20	EVT-1	Examined RB-3 on JPs 1, 2, 3, 4 and 5. NRI
		VT-1	- Examined aux wedges on JPs 9, 11 and 13. RI for slight wear on JPs 9 and 11 aux wedges. Justified continued operation for one cycle. - Examined AS-1 on JP 9 SS and JP 11 VS. NRI - Examined main wedge WD-1 on JPs 1, 2, 7, 8, 9, 11, 12, 13, 14, 17, 18, 19 and 20 for wedge wear. One RI for a bent main wedge handle. Condition acceptable as-is. - Examined swing gate keeper tack welds on JPs 7, 8, 9, 10 and 20. NRI - Examined JPs 1 and 2 transition pieces and sensing lines to address operating trends. NRI - Examined JP 11 swing gate bolting and ratchets. Swing gate installed in D3R19. NRI
	11/10 – R21	EVT-1	- Examined AD-1, AD-2, AD-3a, AD-3b on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI - Examined MX-3a and DF-1 on jet pumps 1, 10, 11, 14 and 15. NRI. - Examined MX-3b and DF-2 on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI. - Examined RS-1, RS-2, and RS-3 on jet pumps risers 5-6, 7-8, 15-16, 17-18 and 19-20. NRI. - Examined RS-8, -9, -10, and -11 on all of the jet pumps. NRI. - Examined RB-1 on jet pumps 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19. NRI.

		VT-1	- Replaced an aux wedge on JP 11. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined (secondary) riser brace arm to yoke welds on jet pump 19. RI with the condition acceptable as-is. - Examined swing gate latches and welded keepers on jet pumps 4, 5, 6, 15 and 16. NRI - Examined sensing line clamps on jet pumps 1 and 20. NRI - Examined main wedge WD-1 on JPs: 3, 4, 5, 6, 10, 15 and 16 for wedge wear. NRI
	11/12 – R22	EVT-1	- Examined RB-2 welds on jet pumps 9-12 & 19. NRI - Examined RS-4 & RS-5 on JP risers 1/2, 17/18 & 19/20. NRI - Examined RS-2 on JP risers 1/2, 3/4, 9/10, 11/12 & 13/14. NRI - Examined MX-1 welds on JPs 6-10. NRI - Examined RB-3 welds on 5 JPs. NRI - Examined JP-11 BB-2. NRI
		VT-1	- Examined RB-3 welds on all 20 JPs. NRI - Examined WD-1 on JPs 1, 2, 8, 11, 12 & 14. NRI - Examined swing gate keeper tack welds on JPs 1, 12, 13, 14 & 19. NRI - Examined Aux wedges on JPs 9 & 11. RI - Some wear was observed. - Examined vessel side AS-1 on JP 11. NRI
		VT-3	- Examined IN-5 bolting on JPs 6-10. NRI - Examined slip joint on JP 11. NRI
	11/14 – R23	VT-1	- Examined WD-1 on all jet pumps. RIs for wear on jet pump 9 and bent bail handles on jet pumps 17 and 20. - Examined swing gate keeper tack welds on four jet pumps and swing gate ratchets on one jet pump. NRI - Examined Aux wedges on JPs 9 & 11. RI - Wear was observed with both auxiliary wedges. - Examined vessel side AS-1 on JP 11 and shroud side AS-1 on JP 9. NRI

		VT-3	- Examined sensing line clamps on six jet pumps. RI on JP 12 due to gap between clamp and sensing line standoff bracket. - Examined jet pump 9 slip joint. NRI
	11/16 – R24	EVT-1	- Examined MX-3a and DF-1 on jet pumps 6, 7, 16, 17 and 20. NRI. - Examined MX-3b on jet pumps 9, 12, 13, 18 and 19. NRI. - Examined AD-1, AD-2, AD-3a and DF-2 on jet pumps 2, 3, 4, 5, 8, 9, 12, 13, 18 and 19. NRI. - Examined RS-1 and RS-3 on jet pumps risers 1-2, 3-4, 9-10, 11-12 and 13-14. NRI. - Examined RS-8 and -9 on jet pumps 11-12, 13-14 and 15-16. NRI. - Examined RS-10 and -11 on jet pumps 1-2, 11-12 and 15-16. NRI. - Examined RB-1 on jet pumps 1, 2, 3, 4 and 20. NRI. - Examined AS-1 on JP 9 shroud side and JP 11 vessel side set screws. NRI.
		VT-1	- Replaced aux wedge on JP 11 and installed slip joint clamps on jet pumps 11 and 12. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined aux wedge on JP 13. Minor wear noted. - Examined main wedge WD-1 on JPs: 4, 5, 7, 10, 11 and 19 for wedge wear. NRI - Examined main wedge WD-1 on JP 9. No change to previous wear.
		VT-3	- Examined sensing line clamp on JP 12. No change to previous indication.
Jet Pump Beams	4/94-R13	UT	Jet pump beams are UT examined each outage using technique capable of detecting cracking at throat and ears. Original group 1 beams.
	4/97-R14	UT	Examined all beams. Two beams with indications replaced. Balance NRI
	2/99-R15	UT	Examined all beams. NRI
	10/00-R16	UT	Two beams with indications replaced with group 2 style beams. Balance NRI.
	03/03-D3M09	NA	Replaced all 17 original beams with weld-less keeper Group 2 beams.

	10/04 – R18	VT-3	Examined 17 group 2 beam bolt retainer mechanisms (weld-less keeper) to ensure all keepers were engaged. NRI.
		EVT-1	Examined 3 group 2 welded keeper style beams. BB-1 and BB-2 on Jet Pumps 5, 8, and 13. NRI.
	11/06 – R19	NA	Pre-emptive replacement of aging beams on JPs 5, 8 and 13 rather than UT examine.
	11/08 – R20	VT-1	- Examined beam ratchet engagement on JPs 5, 8 and 13 after 1 cycle of operation. NRI - Examined beam and ratchet engagement on JPs 1 and 2 to address operating trends. NRI
	11/12 – R22	UT	Examined BB-1, BB-2 and BB-3 on 18 of 20 jet pump beams (Group 2). NRI
	11/14 – R23	UT	Examined BB-1, BB-2 and BB-3 on jet pump 11 beam (Group 2). NRI
		VT-1	Examined all 20 jet pump beam retainer clips. NRI
LPCI Couplings	NA		
Lower Plenum	4/97-R14	MVT-1	CRD Stub Tube, CRD H7. NRI.
	4/97-R14	MVT-1	ICH/RPV-1 and ICHGT/ICH-1, two inspected from cell H7. NRI.
	10/00-R16	EVT-1	Per BWRVIP-47: examined CRGT-1, 2 and 3 on D10. NRI.
	10/02-R17	EVT-1 and VT-3	Examined 9 CRGT-1, 2 and 3 and FS/GT-ARPIN. NRI. This completes first 5% in 6 years.
	10/04 – R18	VT-3	Bottom Head Drain cleaning project created access for the following examinations: - Examined eight Stub Tube to Vessel Welds (ST/RPV-1) and eight Stub Tube to CRD Housing Welds (CRDH/ST-1) in cells: F7, G6, G7, G8, H7, H8, H9, and J8. NRI. - Inspected two locations for Core Plate to Stiffener Plate Stitch welds: G7 & G8 beam welds. NRI. - Examined two locations for Stiffener Plate to Stiffener Rods welds: G7 and H8 beam tie rods. NRI.
	11/08 – R20	VT-3	Examined 9 CRGT-1 and FS/GT-ARPIN. NRI. This completes 10%.

		EVT-1	Examined 9 CRGT-2 and 3. NRI. This completes 10%.
	11/10 – R21	VT -3	Installation of a plug in the bottom head drain to support drain line valve maintenance created access for the following examinations from cells G7 and H8: - Examined accessible portions of eight Stub Tube to Vessel (ST/RPV-1) welds, eight Stub Tube to CRD Housing (CRDH/ST-1) welds and eight CRD Housing to Cap (CRDH-1) welds. NRI. - Examined accessible portions of four In-Core Monitor Housing to Vessel (ICH/RPV-1) welds, four In-Core Monitor Housing to In-Core Housing Guide Tube (ICHGT/ICH-1) welds, two In-Core Housing Support Hardware to In-Core Housing Guide Tube (ICHS/ICGT-1) tack welds and four In-Core Housing Support (ICHS-1) hardware tack welds. NRI.
Feedwater Spargers (Not in BWRVIP Scope)	11/06 – R19	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on four brackets. Justified operation for one cycle. Inspected sparger repair hardware from D2R18 isokinetic probe retrieval. NRI
	11/08 – R20	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on five brackets. Justified operation for one cycle.
	11/10 – R21	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. No apparent change in wear from R20.
	11/12 – R22	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R21. Performed inspections of spargers, arm welds and t-box welds. RI - Dent on one nozzle.
	11/14 – R23	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R22.

Steam Dryer	10/04 – R18	"Best Effort" VT-1	- Examined exterior surfaces including outer hoods, historical repair areas, tie bars and attachment welds, four lifting assemblies, four hold down assemblies, two man way covers, cover plates, fourteen gussets, upper ring welds, vertical guide welds, outlet plenum lower horizontal welds, outlet plenum vertical welds, and perforated plates. Multiple indications identified, including structural fatigue flaws in the outer hood areas. Outer hoods modified to repair cracking. - Examined interior surfaces including: drain channel welds, supports, vertical and horizontal plates, support ring, horizontal cross beams, and horizontal cross beam gussets. Initial start-up steam sample probe discovered missing. Probe located and retrieved from steam separator. Multiple non-structural indications also noted.
		VT-3	Examined interior and exterior skirt. Indications noted.
	11/06 – R19	"Best Effort" VT-1	Performed VT-1 inspection of outer hood welds on old dryer where previous indications had been identified and repaired. NRI.
		NA	Installed new dryer.
	11/08 – R20	"Best Effort" VT-1	Examined critical components on steam dryer after one cycle of operation per GE recommendations. One RI where dryer contacted steam separator guide rod (RI on guide rod also). Dryer and guide rod indications acceptable for one cycle of operation.
	11/10 – R21	"Best Effort" VT-1 and VT-3	Examined critical components on steam dryer. The RI from R20 where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change on both the SS guide rod and the SD.
	11/12 – R22	"Best Effort" VT-1 and VT-3	- Examined critical components on steam dryer. The previous RI where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change. - Examined dryer support lugs. Minor indications noted due to contact with the dryer.

	11/14 – R23	VT-1	- Examined the previous RI where the dryer contacted the steam separator guide rod with no change noted on dryer and guide rod. - Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
	11/16 – R24	VT-1	- Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
Top Guide	4/94-R13	VT-1	Examined beam intersections in five cells in response to industry experience. NRI.
	4/97-R14	VT-1	Per BWRVIP-26, baseline examined all four top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at the four aligner assembly locations. NRI.
	10/00-R16	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined rim weld 11. NRI.
	10/04 – R18	VT-1	Examined 90° and 180° top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at 90° and 180°. NRI.
	11/06 – R19	EVT-1	Examined rim weld from cell 03-34. NRI
	11/08 – R20	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined top guide rim weld. NRI
	11/12 – R22	EVT-1	- Top guide rim weld was inspected at accessible locations. NRI - Top guide grid beams were inspected from 10% of the cells (18 cells). NRI.
		VT-1	The aligner pins and sockets at all four locations. Indications identified at all four aligner blocks. Indications evaluated as acceptable for one cycle.
	11/14 – R23	VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. No change to previously identified indications.
	11/16 – R24	EVT-1	Top guide rim weld was inspected at accessible locations. NRI
		VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. New growth was observed on one of the previously identified indications.

Vessel	10/02 – R17	UT	Examined vertical welds SC1A, SC1C, SC2B, SC3A, SC3B, SC3C, SC3D, SC4A, SC4B, SC4C, and SC4D. NRI.
	10/04 – R18	UT	- Examined vertical welds SC1B, SC2A, SC2C, SC3A, and SC3B. NRI. Satisfies third interval Section XI inspection requirements. - Examined two original vessel construction base metal repair areas in beltline as required by Section XI. NRI.
		VT-3	Inspected cladding in accordance with ASME Section XI. NRI.
	11/06 – R19	VT-3	Inspected the reactor vessel cladding from the shroud flange to the reactor flange in accordance with ASME Section XI. NRI
	11/12 – R22	UT	Examined all 14 vertical welds, the flange to shell circumferential weld and two original vessel construction base metal repair areas in beltline as required by Section XI. All identified indications acceptable per Table IWB-3510-1.
		EVT-1	Examined weld and heat affected zones on four level instrument nozzles. NRI
Nuclear Instrument Dry-tubes (Not in BWRVIP Scope)	4/94 - R13	VT-1	Identified one cracked dry tube (24-37). Replaced. Examined every other outage to date. Per Reutter-Stokes recommendations, have not reached manufacturer's service life.
	11/06 – R19	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/08 – R20	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/10 – R21	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. RI identified movement on one IRM between the plunger and the Top Guide. Rub marks were also noted on the plunger. Acceptable as-is.
	11/12 – R22	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/14 – R23	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI
	11/16 – R24	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI

Steam Separator (Not in BWRVIP Scope)	10/04 – R18	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear that was evaluated as-is for continued operation. Examined eight standpipe to shroud head welds and eight gusset to ring welds, NRI.
	11/10 – R21	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation. Replaced two SHBs. One of the two was missing the pin and the other had excessive pin to window wear.
	11/12 – R22	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/14 – R23	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/16 – R24	VT-1	Examined pin and window condition on 2 shroud head bolts. No change to previous wear.
Piping Welds (BWRVIP-75-A)	11/08 – R20	UT	Performed manual UT on four (4) IGSCC Category C welds and two (2) IGSCC Category A welds. None of these welds were dissimilar metal (DM) welds. No relevant indications identified.
	11/10 – R21	UT	Performed manual UT on six (6) IGSCC Category D welds. Five of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/12 – R22	UT	Performed manual UT on seven (7) IGSCC Category D welds. Four of these welds were on the reactor head spray system and three were on the reactor head vent system. Four of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/14 – R23	UT	Performed manual UT on nine (9) IGSCC Category C welds. None of these welds were dissimilar metal (DM) welds. No relevant indications were identified.

	11/16 – R24	UT	Performed UT exams on six IGSCC Category D welds. Two were on the HPCI system and four on the ISCO system. All six of these welds were DM welds. Five of the welds had automated exams performed. No relevant indications were identified.
Cast Austenitic Stainless Steel	11/12 – R22	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/14 – R23	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/16 – R24	EVT-1	Inspected one fuel support piece and one control rod guide tube base. NRI

Reactor Internals Inspection History

Plant: **Duane Arnold Energy Center**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1995	UT	Performed ultrasonic examination of the accessible areas. Baseline per BWRVIP-01, no indication were detected.
	2001	UT	Performed ultrasonic examination of the H1-H7 welds, no indications found.
	2010	Phased Array UT	Unable to complete the ultrasonic examination of the accessible areas due to equipment issues. Performed OD EVT-1 inspections to supplement and submitted Deviation Disposition to do the UT exams in 2012. No indications found.
	2012	Phased Array UT	Indication on H1 weld, approx. 1" long and 1/8" deep, ID. All other welds no indications.
Access Hole Covers	2012	Phased Array UT	Performed ultrasonic examination of 0° and 180° AHC. Two indications found on each AHC up to 70% through wall and 30% around. Evaluated in accordance with BWRVIP-180.
Shroud Support	1988/1993	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	1998	VT-3	VT-3 of shroud support.
	1999	VT-3	Shroud Support including H-8/H-9 (360 degrees).
	2001	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	2003	VT-3	Shroud Support including H-8/H-9 (180 to 360 degrees).

	2005	VT-3	Shroud Support including H-8/H-9 (0 to 180 degrees).
	2007	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of 180° of the shroud plate including both access hole covers – no indications.
	2009	VT-3	Shroud Support including the H-8/H-9 (0 to 180 degrees) – no indications.
	2012	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of H8/H9 – no indications.
Core Spray Piping	96 (portion every RFO)	VT	Performed Visual Examination (EVT, CSVT, VT-3), baseline per BWRVIP-18, no indications were detected.
	1998	EVT-1	Reinspection per BWRVIP-18 – no indications.
	1999	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2001	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2003	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2005	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2007	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2009	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2010	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2012	EVT-1	Reinspection per BWRVIP-18 – no indications.

	2014	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2016	EVT-1	Reinspection per BWRVIP-18 – no indications
Core Spray Sparger	96 (portion every RFO)	VT	Performed Visual Examination (CSVT, VT-3), baseline per BWRVIP-18, no indications were detected. One sparger nozzle is inspected every other RFO due to a missing tack weld.
	1999	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2001	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2005	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2009	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2012	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2014	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
Top Guide (Rim, etc.)	1995	VT-1 (1/2 mil wire)	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. 100% inspection of the grid locations has been completed over the past three RFOs.
	1998	VT-3	VT-3 0° location.
	1999	VT-3	Examined nine cells (top general and bottom of grid areas).
	2001	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect the two hold down assemblies.

	2003	VT-3	Examined five cells (top general and bottom of grid areas).
	2005	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect two hold down assemblies.
	2005	VT-3	Examined four cells (top general and bottom of grid areas).
	2007	VT-1	Performed VT-1 examination of the bottom side of eight grid locations – no indications.
	2009	VT-1 VT-3	Performed VT-1 of the Latches at 46° and 226° location. VT-1 of the fillet welds on the contour wedges at 90° and 270°. Was not able to obtain 100% coverage of the fillet welds on the contour wedges due to the fuel being in the way. Will re-schedule in 2010. Performed VT-3 of the top guide – no indications.
	2010	VT-1 VT-3	Performed VT-1 of the Latches at 136° and 316° location. VT-1 of the fillet welds on all contour wedges. Performed VT-3 of the top guide – no relevant indications.
		EVT-1	Performed EVT-1 at Grid Locations 42-27, 42-23, 22-43, 22-03, 02-23, and 02-19 – no relevant indications.
	2014	VT-1	Performed VT-1 of the Latches at 226° location – no relevant indications. Performed VT-1 of the contour wedges and fillet welds at 90° and 270°. Was not able to obtain 100% coverage of the contour wedges and fillet welds due to the fuel bundle being in the way. Will re-schedule exams for 2016.
	2016	VT-1	Performed VT-1 of the contour wedges and fillet welds at 90° and 270° and verified that alignment blocks in place. Previous indications identified in 2010 have not changed. An additional shallow indication was found on a contour wedge

			and on an alignment block. Will schedule exams for 2018.
Core Plate (Rim, etc.)	1995	VT-3	Verified 25% core plate bolts were in place.
	1998	VT-3	Verified 20% core plate bolts.
	1999	VT-3	Examined Fuel support castings in nine cells, no indications.
	2001	VT-3	Verified rim hold down bolts 1-54 Examined Fuel support castings in ten cells, no indications.
	2003	VT-3	Examined Fuel support castings in five cells, no indications.
	2005	VT-3	Examined Fuel support castings in twenty cells, no indications.
	2007	VT-3	Performed a general VT-3 of Fuel Support Casting in eight locations – no indications.
	2009	VT-3	Performed a VT-3 examination of Fuel Support Castings in 12 locations – no indications.
	2012	VT-3	Performed VT-3 on 12 of 54 core plate bolts – no indications
	2014	VT-3	Performed VT-3 on 14 of 54 core plate bolts – no indications.
SLC	1993	PT	Liquid Penetrant examination of the nozzle-safeend weld.
	2001	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2003	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2005	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld.

	2007	UT	Performed Appendix VIII UT of the Nozzle-Safeend Weld – no indications.
	2016	UT	Performed Appendix VIII Automated Phased Array UT of the Nozzle-Safeend Weld – no indications.
Jet Pump Assembly	96 (sample every RFO)	VT-3	Inspection of the riser spt pads (SIL551), holddown beams (SIL330), sensing lines (SIL420), three point contact (RICSIL078). Will inspect Riser Elbow in 1998. Repair to the set screws have been completed.
	1998	MVT-1	50% of total number of jet pumps, 100% of each inspected – no indications. All hold down beams – no indications.
	1999	UT EVT-1	DF-1 on JPs 1, 2, 3, 4, 13, 14, 15, 16, IN-4, MX-2 and WD-1 on JPs 3, 4, 13, and 14, RB-1 and RB-2 on JPs 3, 4, 13 and 14. This completes all exams on 8 of 16 JPs.
	2001	EVT-1	RB-1, RB-2, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, on JPs 7 and 8. No indications.
	2003	EVT-1	RB-1, RB-2, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, and 10. RS-1, RS-2, RS-3, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, 10, 11, 12. DF-1 on JPs 5, 6, 7, 8, 9, and 10. No indications. All hold down beams - no indications.
	2007	UT	Performed UT of all 16 Jet Pump. Holddown beams using GE technique – no indications.

	2007	EVT-1	AD-1 on JPs 15,16 AD-2 on JPs 15, 16 DF-1 on JPs 11, 12, 15, 16 DF-2 on JPs 15, 16 IN-4 on JPs 11, 12, 15, 16 MX-2 on JPs 11, 12, 15, 16 RB-1 on JPs 1, 2, 11, 12, 15, 16 RB-2 on JPs 1, 2, 11, 12, 15, 16 Riser Brace Pad on JPs 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16 RS-1, RS-2, RS-3 @ 324° location RS-6 on JPs 11, 15 RS-7 on JPs 12, 16 RS-8, RS-9 @ 252°, 324° locations
		VT-1	WD-1 on all 16 JPs No indications noted from any of the visual examinations.
	2009	EVT-1	DF-2 on JPs 1, 2, 3, 4, 13, 14 AD-1 on JPs 1, 2, 3, 4, 13, 14 AD-2 on JPs 1, 2, 3, 4, 13, 14 RS-1, RS-2, RS-3, TS-1A @ 36°, 72°, 288°
		VT-3	Sensing Line Clamp on JPs 1, 2, 3, 14 Sensing Line Support on JPs 4, 5, 12, 13 Sensing Line Exits at 90° and 270° No indications noted from any of the visual examinations.
	2010	EVT-1	RB-1, RB-2 on JPs 5, 6, 7, 8 RS-6, RS-7 on JPs 5, 6, 7, 8 RS-8, RS-9 on all JPs IN-4, MX-2 on JPs 5, 6, 7, 8 DF-1, DF-2 on JPs 5, 6, 7, 8 AD-1, AD-2 on JPs 5, 6, 7, 8 RS-1, RS-2, RS-3, TS-1A @ 108°, 144°
		VT-3	Sensing Line Clamp on JPs 6, 7, 8 Sensing Line Support on JPs 6, 7, 8 No relevant indications, indications on sensing line clamps were determined to be the result of initial installation.
	2012	EVT-1	DF-1, DF-2 on JPs 13, 14, 15, 16 AD-1, AD-2 on JPs 13, 14, 15, 16 RS-1, RS-2, RS-3, TS-1A @ 288°, 324°

	2014	EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 3 (at 64°), and 4 (at 80°) - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JPs 9 (208°) and 10 (224°) – no relevant indications.
	2016	UT	Performed UT of all 16 Jet Pump. Holddown beams using WesDyne technique – no indications.
		EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 11 and 12 - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JP 11 and standoff on JP 12– no relevant indications.
CRD Guide Tube & Stub Tube	95 (every 10 years)	VT-3	Inspected accessible portions of three guide tubes and three stub tubes, no indication were detected.
	2003	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2005	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2007	VT-3	Performed general VT-3 examination of eight locations – no indications.
Dry Tube	88 (6 cycles and then every three cycles)	VT-1 (1 mil wire)	Inspected in 1988 with indications reported, replaced with the new design.
	1999	VT-3	Inspected accessible portions of 11 dry tubes, no indications noted.

	2007	VT-1	Performed VT-1 of upper 24" of five dry tubes. Note the exam was performed on the accessible areas – no indications.
	2009	VT-1 VT-3	Performed examination on four dry tubes. Note the exam was performed on the accessible areas – no indications.
	2010	VT-1	Performed examination on six dry tubes. Note the exam was performed on the accessible areas – no indications.
	2014	VT-1	Performed VT-1 on five (5) dry tubes. Note the exam was performed on the accessible areas – no indications.
	2016	VT-1	Performed VT-1 on two (2) dry tubes. Note the exam was performed on the accessible areas – no indications.
Instrument Penetration			
Vessel ID Brackets	Every 10 years	VT1(active fuel) VT-3 all others	Per ASME Section XI.
LPCI Coupling	N/A	N/A	Not applicable to DAEC.
Top Head	1998	VT-3	No indications.
	1999	VT-3	No indications.
	2003	VT-3	No indications.
	2005	VT-3	No indications.
	2007	VT-3	Performed VT-3 of interior portion of the RPV Head – no indications.
Guide Rod	1998	VT-3	No indications.
	1999	VT-3	Both examined (found cracked tack weld on 0 degree rod which was evaluated as acceptable).
	2001	VT-3	Inspected 0 degree guide rod, no additional indications.

	2003	VT-3	Inspected 180 degree guide rod, no indications.
	2007	VT-3	Inspected 180 degree guide rod, bracket, and bracket welds – no indications.
	2009	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
	2016	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
Sample Holder Integral Attachments	1998	VT-1 VT-3	No indications.
	1999	VT-1 VT-3	108 and 288 degree examined with no indications.
	2001	VT-1 VT-3	108 degree examined with no indications.
	2003	VT-1 VT-3	36 and 108 degree examined with no indications.
	2005	VT-1 VT-3	288 degree examined with no indications.
	2007	VT-3	108° location – no indications.
	2009	VT-3	288° location – no indications.
	2012	VT-3	All upper brackets – no indications.
	2014	VT-1	All lower brackets – no indications.
Core Spray Piping & Sparger Brackets	1998	VT-3	No indications.
	2001	VT-3	No indications.
	2005	VT-3	No indications.
	2009	EVT-1	Performed EVT-1 on the Piping Brackets at 30°, 150°, 210°, and 330° - no indications.

		VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2012	VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2014	VT-1	Performed VT-1 on the Sparger Bracket at 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2016	EVT-1 & VT-3	Performed EVT-1 on the Piping Bracket attachment welds and VT-3 of the attachment hardware at 30°, 150°, 210°, and 330° locations – no indications.
Jet Pump Riser Support Pad	1998	VT-1	No indications.
	2003	VT-1	216 degree pad – no indications.
	2005	VT-1	144 and 252 degree pads – no indications.
	2014	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 3 (at 64°), and 4 (at 80°) – no indications.
	2016	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 11 and 12 – no indications.
Feedwater Spargers	1998	VT-1 VT-3	Indications around flow holes.
	2001	VT-1 VT-3	No additional indications.
	2005	VT-1 VT-3	No additional indications.
	2007	VT-1	Detailed inspection of all four spargers at the following locations due to broken keeper: Vessel Attachment Keeper to pin Handle interface Keeper to Sparger Bracket weld Pin to sparger bracket Pin to wall bracket

			Sparger Bracket & Bolts Sparger Bracket to Vessel Measurement Sparger to End Plate Jacking Bolts (two spargers only) T-Box to Sparger Welds Wear was noted in several locations. (details can be provided if requested).
	2009	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications
		EVT-1/ VT-3	Performed EVT-1/VT-3 of Bracket Welds at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no indications Implemented a FW Sparger Modification to repair the indications noted in 2007. This modification was to re-install the preload on the spargers @ 225° and 315°.
		VT-1	Performed VT-1 on FW Brackets @ 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - wear was identified on the 264° 276°, and 354°.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2012	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.
		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2016	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.

		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
Steam Dryer	2003	VT-1/3	Inspect per GE SIL644. Indications in Upper Support Ring, Drain Channels, and Access Openings- all indications evaluated "use as is".
	2005	VT-1/3	Inspect per GE SIL644 Rev 1. Indications in Drain Channels and Upper Support Ring – all indications evaluated "use-as-is". No change in previous indications.
	2007	VT-1	Inspected per BWRVIP-139 (all exterior locations) Indications in Drain Channels, Access Openings and Upper Support Ring. All indications evaluated "use-as-is" for one cycle. Some of the previous indications could not be located and some new indication were identified. (Details can be provided if requested.)
	2009	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). All previously identified indications were noted as "No change". Three new indications were identified. 1) Upper Guide Bracket was observed to have a rolled piece of metal extending out and below the face/corner of the guide channel. 2) Middle weld on Tie Bar #4 was found cracked, and 3) Lower guide bracket, 180° side was found bent. All indications were determined to be acceptable.
	2010	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). Two previously identified indications were noted as NRI, all others were "No change". Three new indications were identified on access hole

			cover. All indications were determined to be acceptable. Repairs made to Tie bars 3, 4, and 7 and to the rolled metal on the upper guide found during previous outage.
	2012	N/A	No inspections
	2014	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
	2016	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
Dissimilar Metal Weld	2009	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on four (4) Category C, seven (7) Category D and two (2) Category E dissimilar metal welds.
	2010	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on ten (10) Category C, fifteen (15) Category D and two (2) Category E dissimilar metal welds. One category C weld had relevant indications. This was repaired by a weld overlay during the outage.
	2012	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on one (1) Category C dissimilar metal weld – no indications.
	2014	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on three (3) Category C and four (4) Category D dissimilar metal welds – no indications.

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.
	Fall 2016 RF20	UT	Examined 100% accessible regions of H-3, 4, 5, 7. Found 5 indications in H4, all less than 3 inches length, less than 17% thru wall, 1.93% of examined length. Found 1 indication in upper side H5, 5.96 inches in length, depth 15%, 1.39% of examined length. Examined portions of H4 and H7 for off-axis indications in accordance with VIP interim guidance. 2 minor indications identified on H4, both less than 2 inches in length, depth less than 15% thru wall. Re-inspection scheduled for 10 years in accordance with BWRVIP-76 and VIP interim guidance.
Shroud Support	Spring 1994 RF06	VT-3	Examined 6 shroud support pillars 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 RF16	VT-3	Examined annulus surface. No issues or FME found.
	Spring 2012 RF17	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	Examined annulus surface, FOSAR, recovered 5 Powerfect nuts.
		EVT-1	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.
	Spring 2015 RF19	EVT-1	Examined flat access hole cover. No indications.
		EVT-1	Examined top hat access hole cover. Examined 77.78% circumferentially of vertical weld, 24.2% has signs of indications.
	Fall 2016 RF20	VT-3	Examined annulus surface. No issues or FME found.
		VT-3	Examined annulus surface. No issues found. Identified FME removed from the vessel.
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	Examined all creviced and non-creviced weld locations, no indications

		VT-1	Examined all (8) header brackets, no new indications.
	Spring 1999 RF08	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no new indications.
	Spring 2000 RF09	EVT-1	Examined all creviced weld locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Fall 2001 RF10	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Spring 2003 RF11	EVT-1	Examined all creviced weld locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2004 RF12	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2006 RF13	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2007 RF14	UT & EVT-1	Examined all creviced and 100% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2009 RF15	EVT-1	Examined all locations that could not be UT examined in the previous outage, no indications.
		EVT-1 & VT-3	Examined 25% header brackets. No indications.
	Fall 2010 RF16	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.

	Spring 2012 RF17	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.
	Spring 2015 RF19	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
	Fall 2016 RF20	EVT-1 EVT-1 & VT-3	Examined 'B' loop piping elbows (P4a-d), 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 RF16	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 RF16	EVT-1	Examined 4 top guide grid beam locations. No indications.
	Spring 2012 RF17	EVT-1	Examined 2 top guide grid beam locations. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 top guide grid beam locations. No indications. SRM plunger tip was not fully seated but was reseated into the receptacle.
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	50% riser braces (RB-1/2 & RS-8/9), 100% RS-1, no indications

		VT-1	100% sensing lines. Three pumps have cracked standoffs, installed clamps.
		VT-3	100% beams, no indications
		VT-3	100% wedges and setscrews. 1 screw with 1 tack cracked
	Spring 1999 RF08	EVT-1	50% riser brace(RB-1/2 & RS-8/9), no indications
		EVT-1	100% RS-1, no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% beams, 100% wedges and setscrews, no indications
	Spring 2000 RF09	EVT-1	50% riser brace (RB-1/2 & RS-8/9), no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% wedges and setscrews, no indications
	Fall 2001 RF10	VT-1	100% sensing lines, no indications
		VT-3	100% wedges
	Spring 2003 RF11	VT-1	100% wedges, no movement noted
		EVT-1	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
		VT-1	50% sensing lines, no indications
	Fall 2004 RF12	UT	100% beams, BB1/2, no indications
		VT-1	50% sensing lines, no indications
		EVT-1	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	50% sensing lines, no indications
		VT-1	100% wedges, one had minor wedge wear, installed slip joint clamp
		EVT-1	25% RB-1/2, 25% RS-8/9, no indications
	Fall 2007 RF14	VT-1	100% wedges, one had minor wedge wear and SS setscrew gap of 35 mil, installed auxiliary wedge
		VT-1	1 slip joint clamp, no issues
		VT-1	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 VT-3 VT-1 VT-3 EVT-1	100% wedges, no wear found. Slip joint clamp and aux wedge. No issues found. 11 sensing lines. No indications. Installed aux wedge for an issue found previous outage. 50% RS3, no indications.
	Fall 2010 RF16	EVT-1 VT-1 VT-3	100% RS-8/9 and 25% RS-6/7. No indications 50% wedges. No new wear found. 3 sensing line clamps and 1 aux wedge. No issue found.
	Spring 2012 R17	EVT-1& VT-1 VT-1 EVT-1	25% inlet/mixer and diffuser welds (IN4, MX2, DF1/2, AD1/2). No issues found. 3 riser brace welds. No issues found. 50% wedges. No new wear found. 3 RS-1 and RS-2. No issues found.
	Fall 2013 RF18	UT VT-1 VT-1	100% beams, no indications 3 sensing line lower bracket, no indications 6 known setscrews tack cracks. 3 confirmed no growth, 3 no indication.
	Spring 2015 RF19	VT-1 VT-1 VT-3 VT-3 VT-3 EVT-1 EVT-1 & VT-1	50% wedges and rods. No new wear found. 14 sensing line support brackets. No indications. 3 sensing line clamps. No indications. 1 Slip joint clamp. No indications. 2 Aux wedges. No indications. 50% RS-3 Riser to Transition. No indications. 2 Riser Braces, RB-1 & RB-2. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 restrainer bracket to riser pipe welds, RS-6 and RS-7, and 3 riser brace to riser pipe welds, RS-8 and RS-9, no indications.

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 VT-3	Below Core Plate Inspection Examined 100% of CRGT-2 & CRGT-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	VT-1	Examined IAW SIL 409. No indications found.
	Spring 1999 RF08	EVT-1	All 12 dry tubes had circumferential cracking approx 1 inch below the upper collar
	Spring 2000 RF09		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	VT-1	50% jet pump riser bracket, no indications
	Fall 1997 RF07	VT-1 VT-3	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

	Spring 1999 RF08	VT-1	25% core spray header bracket, 100% feedwater sparger bracket, 100% steam dryer support bracket, no indications.
		EVT-1	50% jet pump riser bracket, no indications
		VT-3	100% guide rod bracket, no indications
	Spring 2000 RF09	VT-1	25% core spray header bracket, no indications
		EVT-1	50% jet pump riser bracket, no indications
	Fall 2001 RF10	VT-1	25% core spray header bracket, no indications
		VT-3	100% guide rods, no indications
	Spring 2003 RF11	EVT-1	25% core spray header bracket, no indications
	Fall 2004 RF12	EVT-1	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 EVT-1 & VT-1	25% core spray header brackets. 100% feedwater brackets. Found minor pin wear on 2 pins. Evaluation justified operation for one cycle.
	Fall 2010 RF16	EVT-1 VT-1	25% core spray header brackets. 2 Feedwater bracket pins where wear previously found. No discernable change.
	Spring 2012 RF17	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 VT-1 VT-3	25% core spray header brackets and 4 jet pump riser braces. No issues found. Examined 120deg surveillance capsule assembly.
	Spring 2015 RF19	EVT-1 & VT-1	2 jet pump riser brace arm. No indications.
		EVT-1 & VT-3	25% core spray header brackets.
		EVT-1 & VT-3	100% steam dryer support bracket to RPV. No indications.
		VT-3	2 guide rod flange & brackets. No indications.
		VT-3	100% feedwater sparger vessel attachments. No indications.
		VT-3	2 Feedwater bracket pins where wear previously found. No additional wear.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
LPCI Coupling	Fall 2001 RF10	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2003 RF11	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2006 RF13	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2012 RF17	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2015 RF19	EVT-1 VT-1 VT-3	Examined 50% couplings. Two indications on the shroud attachment ring, ~.88" & 1".

		EVT-1	Expanded scope to include same location on balance of couplings. No indications.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
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	100% drain channels, one indication identified on skirt below a seismic lug access plate weld, 0.75"
		VT-1	100% support ring, no new indications, no growth on previous indication
	Spring 2003 RF11	VT-1	100% support ring, no new indications, no growth on previous indication
		EVT-1	Re-look at skirt indication, no growth
		EVT-1	Manway cover plate
		VT-1	100% cover plates
		VT-3	100% tie bars
		VT-1	100% lifting lug braces, one found severed.
	Fall 2004 RF12	VT-1	100% support ring, no growth on previous indication, new indication identified; 0.625" across top, and 0.75" down face.
		VT-1	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	Previously identified indications on support ring, no growth found.
		VT-1	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 crater crack found on a lifting rod bracket weld. All indications were evaluated for use as is. No repairs required.
	Fall 2010 RF16	VT-1	2nd re-baseline IAW BWRVIP-139 following EPU 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 RF17	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.
	Spring 2015 RF19	EVT-1 & VT-3	100% Support bracket to RPV. No indications.
		VT-1	Examined known flaw for growth. No growth observed.
	Fall 2016 RF20	VT-1	Examined 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 RF16	UT	Examined 5 category C welds after weld crown reduction; 2 by auto, 3 by manual. No indications found.
	Spring 2012 RF17	UT	Examined 1 category E weld by manual UT.
	Fall 2013 RF18	A-UT	Examined 3 category C welds with automated UT. No growth of known embedded flaws, no new indications.
	Fall 2016 RF20	A-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)
	Spring 2015 RF19	VT-3	Examined eight shroud head bolts, including pin area. No indications.
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.
Capsule	Spring 1994 Spring 2015 RF19		Removed 30 degree capsule. Removed 120 degree capsule per EPRI ISP program.

Reactor Internals Inspection History

Plant: **Oyster Creek Generating Station**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Steam Dryer	Fall 2016	Visual	VT-1 of all high stress (red) locations and 10% of green locations. A total of 81 locations were inspected. EVT-1 of all 4 Hold Down Assemblies and all 4 Dryer Lifting Rods. Re-inspected previous Steam Dryer indications and repair areas. Evaluated indication areas with no change and areas with minor change as acceptable as is. New indications on tie bars TB-F measured 1.3" and TB-I ~ ¼". Indications on drain channels welds V07 ID &V15 ID and Jacking Bolt at 50 degrees are new or showing growth or changes from the previous examinations. These indications are acceptable until 2020 which is after plant shutdown.
	Fall 2014	Visual	Re-inspected 2 Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2012	Visual	Re-inspected Steam Dryer indications and repair areas, including indications on the ID, identified during previous outages. Evaluated indication areas with no change and areas with minor change to use-as-is for one cycle.
	Fall 2010	Visual	Re-inspected Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2008	Visual	Completed BWRVIP-139 required inspections of the ID of the dryer using GEH Firefly ROV. Identified 2 areas of fatigue cracking in drain channels and 1 area of fatigue cracking in support beam to mid-support ring weld.

			Evaluated as use-as-is for one cycle in accordance with BWRVIP-139 generic flaw evaluation. Re-inspected Steam Dryer indications and repair areas identified during previous outages. Tie bar N-1 lower repair area was found degraded and GEH issued JCO for one cycle of operation.
	Fall 2006	Visual	Re-inspect Steam Dryer Indications identified during previous outages. EVT-1 cracks in hold-down area from 1R19. VT-1 all 4 lifting lugs and EVT-1 indications on 135 deg. lug. BWRVIP-139 required inspections (top side) completed. New fatigue indications were identified that required repair. Dryer repair project completed with 2 areas stop drilled and one crack in center baffle plate was cut out.
Core Shroud	Fall 2016	VT-3	VT-3 of Tie-Rods at 10 deg and 70 deg. No findings Re-inspection of two horizontal indications on vertical weld V-9. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. No changes in the end points from 2006. These conditions are acceptable for ten years.
	Fall 2014	VT-3	VT-3 of 5 Tie-Rods at 100, 130, 160, 280 and 350 deg. locations. No findings.
	Fall 2012	VT-3	VT-3 of 3 Tie-Rods at 170, 220 and 310 deg. Locations. No findings.

	Fall 2010	VT-3	VT-3 of 2 Tie-Rods at 10 and 70 deg. Locations (#2 and #8). No findings.
	Fall 2008	UT / EVT-1	UT / EVT-1 inspection completed for all 10 shroud vertical welds. One indication found with UT in V10 weld – 1.76 inches long with depth of 0.47 inches. A technical evaluation was completed to use-as-is.
		VT-3	VT-3 Tie-Rods at 100 deg, 130 deg, 160 deg, 280 deg, and 350 deg. No findings.
	Fall 2006	EVT-1	V-9 inspection of ID and OD. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. A technical evaluation was completed to use-as-is. VT-3 Tie-Rods at 170 deg, 220 deg and 310 deg. No findings. VT-1 of Upper Bracket to Shroud Ledge interface on all 10 Tie Rods. No findings.
	Fall 2004	None	No Examinations Required.
	Fall 2002	None	No Examinations Required.
	Fall 2000	EVT-1	V-3, V-4, V-15 and V-16. This was a one sided exam from the OD. No findings.
	Fall 1998	UT EVT-1	V-7, V-8, V-10 and V-12. V-11 I.D. Seven tie-rod assemblies baseline inspected. V-10 exhibited minor OD cracking away from the heat-affected zone. This cracking is believed to be associated with handling lugs that were welded during construction and removed after installation. All other inspected vertical welds were found free of indications. With the inspections

			performed in 16R and 17R, all accessible vertical welds in the shroud core region are complete. The following vertical welds could not be located. V-3, V-4, V-15 and V-16.
	Fall 1996	Visual	Inspected per BWRVIP-07. Three of ten tie rods inspected, no change from installation. EVT-1, OD of V-9 and V-11, (120" total). V-9 exhibited 3 small axial cracks in HAZ on the OD totaling 1.75". The ID of V-9 was free of axial cracks. A number of small transverse cracks were found on the OD and ID of V-9. V-11 was free of any indications. Analysis showed structural margin maintained.
	Fall 1994	Ultrasonic and visual	Inspected per BWRVIP-01 and 03. Cracks were detected in the Shroud welds H2, H4, H6A, and H6B. Lack of fusion was detected in H3 weld and visual cracks on the ID surface. The Tie Rod modification was installed. Base line visual performed of the tie rods.
Shroud Support	Fall 2016	EVT-1	EVT-1 of (2) of the 36 Lug / Clevis pin assemblies - #02 and #08. No findings.
	Fall 2014	Visual	EVT-1 of 5 of the 36 Lug / Clevis pin assemblies - #11, #14, #17, #29 and #36. No findings.
	Fall 2012	UT, EVT-1, VT-3	EVT-1 of 11 of the 36 Lug / Clevis pin assemblies - #5, #6, #12, #13, #18, #22, #23, #25, #31, #32 and #35. No findings. UT of H-9 from the OD (Drywell). Inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found "no change" in the 4" long indication in the N1E nozzle area. No other findings. VT-3 of 360 deg. (100%) of top of H9 weld. No findings.

	Fall 2010	Visual	EVT-1 of 6 of the 36 Lug / Clevis pin assemblies - #1, #2, #7, #8, #20 and #21. No findings.
	Fall 2008	Visual	EVT-1 of 8 Lug / Clevis pin assemblies - #10, #11, #14, #15, #17, #29, #30, and #36. No findings.
	Fall 2006	Visual	EVT-1 of 7 Lug / Clevis pin assemblies - #1, #18, #19, #23, #24, #32 and #33.
	Fall 2004	None	No examinations required.
	Fall 2002	UT	30% UT of H-9 from the OD (Drywell). UT inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found one 4" long indication in the N1E nozzle area. This "service induced" indication is in the bottom side of the H9 weld and does not penetrate into the base metal of the RPV.
	Fall 2000	Visual	25% of H-9, cleaning performed and EVT-1 inspection completed. This completes 100% inspection of the H-9 weld. No findings.
	Fall 1998	Visual	25% of H-9, cleaning performed and enhanced VT-1, no findings
	Fall 1996	Visual	25% of H-9, (different area then the 1994 inspection), cleaning performed and enhanced VT-1, no findings.
	Fall 1994	Visual	25% of H-9 cleaning performed and enchanted VT-1, no findings.
Core Spray Piping	Fall 2016	Visual	EVT-1 of all 10 annulus piping fillet welds. No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD,

			P4gD, P4hD, P3aB, P3bB and P4dB. No findings.
	Fall 2014	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings.
	Fall 2012	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 16.5 deg. No findings. EVT-1 of 25% sample butt welds: P4dA, P4eA, P4fA, P4iA, P4bB, P4cB, P4eB, P4fB, P4gB, and P4hB. No findings.
	Fall 2010	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 285 deg. No findings. EVT-1 of 25% sample butt welds: P4aA, P4g/aA, P3aC, P3bC, P4dC, P4eC, P4fC, P4aB, P3aD, and P3bD. No findings.
	Fall 2008	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD, P4gD, P4hD, P3aB, P3bB, and P4dB. No findings.
	Fall 2006	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 103.5 deg. No findings.

			EVT-1 of 25% sample butt welds: P4bA, P4cA, P2A, P4g/aA, P4g/bA, P4hA, P4iC, P4g/aC, P4g/bC, P4hC, P4bB, P4eB, P4fB, P4gB and P4hB. No findings.
	Fall 2004	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L-3, L-3A, L-4, L-20A, L-13A, L-5, L-7, L-8, L-10, L-11, and L-12 • U-3, U-3A, U-4, U-15A, U-24A, U-7, U-8, U-9, U-10, U-11, U-12, U-16, and U-17 100% of annulus pipe brackets at 15°, 105°, 195° and 285°. No findings. EVT-1 of all creviced welds in the annulus piping = U3, U3A, U4, U15A + U24A; L3, L3A, L4, L13A + L20A.
	Fall 2002	Visual	EVT-1 of a 25% sample (11 welds) of the butt welds (non-creviced) not inspected in 17R or 18R: • U1,U15,U17,U18,U19,U20 • L1,L9,L13,L16,L20 Inspect 100% of annulus pipe brackets (15°, 105°, 195° and 285°) No Findings.
	Fall 2000	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L3, L3A, L4, L6, L13A, L14, L15 and L20A • U3, U3A, U4, U7, U8 and U15A 100% of annulus pipe brackets 15°, 105° 195° and 285°. No findings.

	Fall 1998	Visual	All creviced welds in the annulus piping; sample (25%) of the non-creviced welds in the annulus piping: • L2, L9, L10, L11, L12, L13, L17, L18, L19 and L20 • U2, U5, U6, U13, U14, U15, U21, U22, U23 and U24 Sample (25%) of pipe brackets 285°, 195°
	Fall 1996	Visual	Inspected per BWRVIP- 03. Cleaning of all accessible weld/HAZ surface and performed enhanced VT-1. No findings.
	Fall 1994	Visual and air test	Inspected VT-1, (1 mil wire). No change to pinhole weld defect detected in slip joint in 1992. Note: Pinhole weld defect detected in 1992 in System I. Analysis showed structural margin maintained
Core Spray Sparger	Fall 2016	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings except some rolled material noted on the CS SB 271 deg at the middle bracket sparger B contact point. This wear is not in a weld or HAZ of a weld. Inspected all ten sparger repair clamps. No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings.

	Fall 2014	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C & D. No findings. VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2012	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings. Inspected all 10 sparger repair clamps. No findings.
	Fall 2010	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C and D (CASS). No findings.

			VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2008	Visual	EVT-1 Sparger Pipe End Cap welds: S4A – 60 deg., S4A – 240 deg., S4B – 60 deg., S4B – 240 deg. No findings. EVT-1 "T" box welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-C. No findings. VT-1 of 50% of the sparger bracket welds – SB – 055, 065, 150, 208, 235, 271 and 330 deg. No findings.
	Fall 2006	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 60 deg., S4C - 240 deg., S4D - 60 deg., and S4D - 240 deg. No findings. EVT-1 "T" box welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-B. No findings. VT-1 of 50% of the sparger bracket welds – SB – 026, 091, 120, 179, 240, 300, and 359 deg. No findings.
	Fall 2004	Visual	Inspected all sparger repair clamps. No findings. Inspected end cap welds S4A-60, S4A-240, S4B-60, and S4B-240. No findings. Inspected sparger brackets SB-055, 065, 150, 208, 235, 271 and 330. No findings
	Fall 2002	Visual and Air Test	VT-1 all spargers, nozzles, end cap welds and repair clamps. No findings. No new leaks were identified during the Air Test.

	Fall 2000	Visual and Air Test	All sparger end cap welds were cleaned and EVT-1 inspected. No findings. VT-1 of spargers, repair clamps, and nozzles. No findings. No new leaks were identified during the Air Test.
	Fall 1998	Visual and Air Test	All sparger repair clamps, both spargers.
	Fall 1996	Visual and air test	Inspected per BWRVIP-03. Cleaned end cap welds and performed enhanced VT-1. No findings. Tee box welds are clamped and not accessible to clean or visual. Performed VT-1, (1 mil wire), of sparger piping and nozzles. No findings.
	Fall 1994	Visual and Air Test	Performed VT-1, (1 mil wire) of sparger piping and nozzles. No findings.
	1978 - 1980	Visual	(2) Cracks in sparger piping. Repair clamps installed. Note: Cracking found in sparger in 1978; repaired with clamps. Sparger has been inspected and air tested every outage since then; report submitted to NRC for approval for restart every outage.
Top Guide	Fall 2016	Visual	EVT-1 of previous top guide grid beams indications. The largest indication was measured from cell 43-44 at 3.875". Three indications that were measured in 2010 had longer lengths in the 2016 examination (slight growth less than an inch). The indications are acceptable as is for 4 years. VT-1 of two Hold Down Bolts (33 and 213 deg). No findings.
	Fall 2014	None	No inspection required this outage.
	Fall 2012	Visual	VT-1 of 2 hold-down bolts at 123 deg. and 303 deg. No findings.

	Fall 2010	Visual	EVT-1 Inspection and Measurement of 3 Cracks in Grid Beams (#4, VT-3 & VT-6). Some crack growth was observed. Flaw evaluation completed to support use as is. BWRVIP-183: Inspect 5% = 7 cells. No findings.
	Fall 2008	None	Not required for this outage by analysis.
	Fall 2006	Visual	EVT-1 of selected known flaws in grid beams: #4, VT-3 and VT-6. One area showed no growth, while the other two had grown between 0.25" and 0.75" from the 2002 outage to the 2006 outage. A flaw evaluation was performed to use-as-is.
	Fall 2004	Visual	VT-1 of top guide hold down bolts at 303 and 123 degrees. No findings. EVT-1 of VT-6 crack showed no measurable growth. Could not visually locate two other existing UT indications.
	Fall 2002	Visual	EVT-1 of two existing cracks measured in 18R outage (#3 and #5). No change to crack length identified.
	Fall 2000	Visual	Top guide hold down bolt assembly VT-3 at 33° and 213°. Top guide beam to rim fillet welds VT-1 at 33° and 213°. No findings. VT-1 of two existing cracks (#3 and #5) with cleaning. Both cracks measured on both sides. Crack #5 showed approx. 1" growth. Crack #3 showed no measurable growth.
	Fall 1998	None	Not required for this outage by analysis.
	Fall 1996	Ultrasonic 100% grid beams	12 indications emanating from notches detected at intersections of cross members. 5 of the 6 cracks on bottom

			side of member at mid-span detected. Removed sample from beam with crack to investigate root case.
	Fall 1994	Visual	[Under side of Top Guide] Three additional vertical cracks were detected at mid-span locations. Disposition use as is.
	Fall 1992	Visual	[Under side of Top Guide] Two additional vertical cracks were detected at mid-span location. Disposition use as is.
	Fall 1991	Visual	[Under side of Top Guide] A vertical crack was detected at mid-span location. Disposition use as is.
Core Plate	Fall 2016	None	No exams were required.
	Fall 2014	None	No exams were required.
	Fall 2012	None	No exams were required.
	Fall 2010	Visual	VT-1 inspected 3 In-core guide tube plugs 28-45, 44-13 and 44-21. No findings.
	Fall 2008	Visual	Visually inspected core plate wedges at 96° and 276° azimuths. No findings.
	Fall 2006	None	No exams were required.
	Fall 2004	Visual	No wedge inspections required. Inspected in-core guide tube plugs 04-29, 20-37, and 12-21. No findings.
	Fall 2002	Visual	No inspections needed. Wedges replace hold down bolt inspections.
	Fall 2000	Visual	Visually inspected all 8 wedges to verify integrity after first cycle of operation. All wedges found as installed.
	Fall 1998	Visual	Wedges installed. No further exams of core plate were performed.

	Fall 1996	Visual	Inspected top portion only of 18 hold down bolt that were not inspected in fall 1994 and top periphery section at bolt locations. No findings.
	Fall 1994	Visual	Inspected 18 hold down bolt tops only and top periphery at bolt locations inspected. No findings.
Jet Pump Assembly	N/A	N/A	N/A
Jet Pump Diffuser	N/A	N/A	N/A
SLC	Fall 2016	UT	UT examined the N12 liquid poison nozzle DM weld. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	PT	PT of Liquid Poison Nozzle to Safe End Weld. No findings.
	Fall 2010	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2008	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2006	UT	PDI - UT the Liquid Poison Nozzle N12 / SE. No findings.
	Fall 2004	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2002	Visual / PT	PT of Liquid Poison Nozzle – No Indications. Inspect insulated nozzle from drywell during RPV pressure test. No leakage observed.
	Fall 2000	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 1998	VT-2 during Code pressure test.	Not made accessible for direct exam.
	Fall 1996	None	Not made accessible.

	Fall 1994	None	Not made accessible.
CRD Guide Tube	Fall 2016	None	Not required and not made accessible.
	Fall 2014	None	Not required and not made accessible.
	Fall 2012	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 1 guide tube base for CASS (VT-1). No findings
	Fall 2010	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 2 guide tube bases for CASS (VT-1). No findings.
	Fall 2008	None	Not required and not made accessible.
	Fall 2006	EVT-1, VT-3	Inspected 4 guide tubes. No findings.
	Fall 2004	EVT-1, VT-3	Inspected 4 guide tubes. No Findings.
	Fall 2002	EVT-1, VT-3	Inspect 1 guide tube (46-43) removed to support stub tube inspection. No findings.
	Fall 2000	VT-1, VT-3	2 guide tubes. No findings.
	Fall 1998	VT-3	15, no findings.
	Fall 1996	No inspection Performed.	Not made accessible.
	Fall 1994	No Inspection Performed	Not made accessible.
CRD Stub Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.
	Fall 2010	None	No inspections required.
	Fall 2008	None	No inspections required.
	Fall 2006	None	No inspections required.
	Fall 2004	None	No inspections required.

	Fall 2002	VT-1	Visual Inspection of 2 stub tubes found leaking at bottom head in Fall 2000 (42-43 and 46-39). No indications noted.
	Fall 2000	VT-1 VT-2 pressure test	None made accessible. 2 stub tubes found leaking at bottom head (42-43 and 46-39). Performed UT of CRD housing to stub tube welds (J weld) and area of housing to be rolled. No indications. Roll repaired both leaking housings.
	Fall 1998 Fall 1996 Fall 1994	No inspection Performed.	Not made accessible.
In-Core Housing	Fall 2016	None	Not made accessible.
	Fall 2014	None	Not made accessible.
	Fall 2012	None	Not made accessible.
	Fall 2010	None	Not made accessible.
	Fall 2008	None	Not made accessible.
	Fall 2006	None	Not made accessible.
	Fall 2004	None	Not made accessible.
	Fall 2002	None	Not made accessible.
	Fall 2000	None	Not made accessible.
	Fall 1998 Fall 1996 Fall 1994	No inspection performed.	Not made accessible.
Dry Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.

	Fall 2010	Replacement	Replaced final 4 Dry tubes due to service life: IRM-15 and 16; SRM 22 and 23.
	Fall 2008	Replacement	Replaced 4 Dry tubes due to service life: IRM-12, 13, 14 and SRM-21.
	Fall 2006	Replacement	Replaced 4 Dry tubes due to service life: IRM-11, 17, 18 and SRM-24.
	Fall 2004	Visual	VT-1 of SRM 24 found tube not fully engaged in top guide. VT-1 of IRM 17 and IRM 18 found both tubes bowed.
	Fall 2002	Visual	No inspections required.
	Fall 2000	Visual	VT-1 five dry tubes. One found slightly bent – use as is. No findings on others.
	Fall 1998	Visual	VT-1 one dry tube, no findings
	Fall 1996	Visual	VT-1 one dry tube, no findings.
	Fall 1994	Visual	VT-1 four dry tubes, no findings.
Instrument Penetrations	Fall 2016 Fall 2014 Fall 2012 Fall 2010 Fall 2008 Fall 2006 Fall 2004 Fall 2002 Fall 2000 Fall 1998 Fall 1996 Fall 1994	Visual	VT-2 exam from vessel exterior. No findings.
Vessel ID Brackets	Fall 2016	VT-3	VT-3 of 2 guide rod wall brackets. No findings. VT-3 of 6 surveillance specimen brackets @ 30, 210 and 300 deg. No findings. VT-3 / VT-1 of all 4 Spargers and Nozzle Interface Areas. No changes in the indications for spargers at 45 and 135 deg.

	Fall 2014	EVT-1	Inspected all 4 dryer support brackets. Minor changes in wear patterns were evaluated for continued service.
	Fall 2012	None	No inspection required.
	Fall 2010	EVT-1	EVT-1 all feedwater sparger attachment wall bracket welds. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	EVT-1	EVT-1 both Guide Rod Brackets. EVT-1 all 3 Surveillance specimen brackets. No findings.
	Fall 2004	EVT-1	Inspected all 4 dryer support brackets. No findings.
	Fall 2002	EVT-1	All feedwater sparger attachment brackets. Both guide rod attachment brackets. All surveillance sample brackets (30, 210 and 300 degree locations) No indications on attachment welds.
	Fall 2000	EVT-1	All 4 dryer support brackets. Observed wear indications on brackets. No indications on attachment welds. All feedwater attachment brackets inspected. No indications on attachment welds. Cracks observed on feedwater sparger to end bracket welds (non-safety-related component) on 2 ends.
	Fall 1998 Fall 1996 Fall 1994	VT-1	VT-1 of accessible portions of weld on guide rod brackets, steam dryer brackets, surveillance sample brackets. All attachment welds; no findings.
LPCI Coupling	N/A	N/A	N/A
Fuel Support Casting	Fall 2016	Visual	VT-1 Inspection of 1 Fuel Support Casting Cell 26-47. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	Visual	VT-1 Inspection of 1 Fuel Support Casting. No findings.

	Fall 2010	Visual	VT-1 inspection of 2 CRGT Bases (support castings) for CASS program. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	None	None inspected.
	Fall 2004	None	None inspected.
	Fall 2002	None	None inspected.
	Fall 2000	Visual	VT-3 (2) support casting. No findings.
	Fall 1998	Visual	VT-3 (24) support castings. No findings.
	Fall 1996	Visual	VT-3 (25) support castings. No findings.
	Fall 1994	Visual	VT-3 (17) support castings. No finding
Reactor DM Welds (BWRVIP-75-A)	Fall 2014	UT - Auto	UT examined eight (8) dissimilar metal (DM) welds containing alloy 82/182. This included three (3) DM welds on the top head. No new findings identified.
	Fall 2012	UT - Auto	UT examined three (3) Category D nozzle to flange dissimilar metal (DM) welds containing alloy 82/182. No findings. UT examined one (1) Category C recirculation suction nozzle to safe end DM weld N1A. Found no change to previously identified flaw and updated the flaw evaluation for another 2 cycles.
	Fall 2010	UT - Auto	UT examined four (4) Category C nozzle to safe end dissimilar metal (DM) welds containing alloy 82/182. No findings.

	Fall 2008	UT – Auto	UT examined five (5) Category C nozzle to safe end dissimilar metal (DM) welds. One indication identified in N1A recirculation suction nozzle to safe end weld dispositioned as acceptable for 2 cycles in accordance with IWB-3600 flaw evaluation. The 0.21 inch ID connected indication was in the RPV nozzle to clad interface on the Reactor side of the Alloy 182 DM weld. The flaw evaluation was submitted to the NRC.

Note: All indications left "as is" were analyzed and structural margins were acceptable for continued service.

Reactor Internals Inspection History

Plant: **Peach Bottom Atomic Power Station, Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1994	UT & VT	Comprehensive UT Baseline of some Category "C" circumferential welds (H-2, H-3, H-4, and H-5) per BWRVIP-01, Rev. 0. Partial UT baseline of welds H-1, H-6, and H-7, w/ partial Enhanced VT-1 of H-6 OD. 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-6, and OD of H-4 and H-5. Full structural margins calculated using two cycles of crack growth for comprehensively examined welds, one cycle for welds with limited exams. No indications identified on H-2 and H-7.
	1996	UT	Comprehensive UT of welds H-1, H-6 and H-7 per BWRVIP-01, Rev. 1. Exams per BWRVIP-03. Indications identified on ID of welds H-1, H-6 and H-7, on OD of weld H-1. Full structural margins calculated using two cycles of crack growth. Reexaminations planned per BWRVIP-76
	2002	UT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76. Indications identified on each weld. UT of Vertical welds V-1 through V-4. No indications identified. Reexaminations scheduled per BWRVIP-76.
	2012	UT & VT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76, Rev. 1. Indications were identified on all horizontal welds. Horizontal welds H1, H2, H3 and H4

			were evaluated and found acceptable for continued service via a plant specific analysis performed by SIA. Horizontal welds H5, H6 and H7 were evaluated via Table 2-1 of BWRVIP-76. UT of vertical welds V-1 through V-8 were performed with one indication identified on the V-3 weld. The indication was determined to be acceptable for continued service. EVT-1 examinations were performed on the following: shroud ID of the H-4 weld at 045 degrees, the shroud ID intersection of the V-5 and H-4 welds at 090 degrees, shroud ID intersection of the V-6 and H-4 welds at 270 degrees. No indications were identified during the visual inspection of the core shroud.
Shroud Support	1992	VT-3	VT-3 examination of support leg stub welds. No indications identified. VT-3 examination of welds H-7, H-8, and shroud support cylinder. No indications identified.
	1994	VT-3	VT-3 of accessible portions of H-8 weld between Jet Pump #1 and #10. No indications identified.
		VT-1	VT-1 examination around perimeter of 0 deg. access hole cover. No indications identified.
		UT	UT examination of both access hole covers. No indications identified.
	1998	EVT-1	EVT-1 examination of both AHCs. No indications identified. EVT-1 of 10% of shroud support weld H-8, top side, no indications identified. EVT-1 of 10% of shroud support weld H-9, top side, no indications identified.
	2000	EVT-1	EVT-1 examination of both AHCs. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 0° and 180° Azimuth. No indications identified.

	2002	UT	UT of 10% of H-9 weld length from OD of vessel. No indications identified.
	2004	EVT-1	EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 180° and 360°. No indications identified
	2008	EVT-1	EVT-1 examination of both AHCs. No indications identified.
	2010	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		UT	BWRVIP-180 baseline UT exams were completed on both AHCs. No indications identified.
	2012	EVT-1	EVT-1 of the H-9 weld was performed on the 157.5°-202.5° and the 337.5°-022.5° degree segments of the weld. No indications were identified. Note: Examination coverage of the H-9 weld was greater than 10% of the weld.
	2016	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of 10% of shroud support weld H-8, the 157.5 -202.5 deg and 337.5-022.5 deg segments of the weld. No indications identified.
Core Spray Piping	1980 to 1996	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.
	1996	VT-1 (1/2 mil)	EVT-1 (1/2 mil resolution) performed on annulus piping welds per BWRVIP-18. Cracking identified in "B" Header tee-box cover plate weld (P2B). UT performed to characterize indication.

			Evaluation demonstrated structural margin for one operating cycle
	1998	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique. EVT-1 used to supplement UT. No new indications identified. P2B weld reexamination yielded additional margin.
	2000	EVT-1	EVT-1 of nine (9) piping welds not previously UT'd, and of six (6) pipe brackets and attachment welds. No indications identified.
	2002	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (28 welds). EVT-1 used to supplement UT (6 welds). EVT-1 on two (2) support brackets. No new indications identified. P2B weld indication reexamination revealed minimal growth.
	2004	EVT-1	EVT-1 of twelve (12) piping welds not accessible for UT inspection. No indications identified
	2006	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). EVT-1 used to supplement all one-sided UT (12 welds). EVT-1 only on eight (8) pipe welds and six (6) support brackets. P2B weld indication reexamination revealed no growth. New 9/16" indication identified visually at intersection of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.
	2008	EVT-1	Re-inspection per BWRVIP-18, EVT-1 used on (21) pipe welds. P2B weld indication re-examination revealed no growth. The P3B1 9/16" indication revealed no growth. New indication (0.49") identified visually on the upper side of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.

	2010	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). Two sided UT performed on selected P4 elbow welds. EVT-1 used to supplement all one-sided UT on T-box welds (8 welds). P2B weld indication reexamination revealed no growth. P3B1 indications identified some change in measured size due to better cleaning and exam video resolution. . Structural and leakage evaluations found flaw acceptable for continued service.
	2012	EVT-1	EVT-1 examination of 17 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2014	EVT-1	EVT-1 examination of 33 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2016	EVT-1	EVT-1 examination of (7) pipe welds. The examinations re-identified indications on the P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for one cycle. All other examinations identified no indications.
Core Spray Sparger	1980 to 1994	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13, Cracking discovered at tee-box to sparger pipe weld ("B" Sparger, 1982), bolted repair clamp installed. No other indications identified.
	1998	VT-3 & MVT-1	Reinspections per BWRVIP-18, no indications identified.
	2000	EVT-1	EVT-1 of selected sparger welds per BWRVIP-18. No indications identified.

		VT-1	VT-1 of sparger tee-box repair clamp, and approx. 50% of sparger "C" and "D" nozzles and drains. VT-1 of eleven (11) sparger brackets and welds. No indications identified.
	2002	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of seven (7) sparger pipe welds. No indications identified.
	2004	VT-1, EVT-1	VT-1 of six (6) Sparger support bracket welds, one (1) sparger drain, and 50% of nozzles on spargers "C" and "D". EVT-1 of fifteen (15) Sparger pipe welds. No indications identified.
	2006	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2008	EVT-1, VT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. EVT-1 of ten (10) sparger pipe welds. No indications identified.
	2010	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2012	VT-1, EVT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. One recordable indication was identified on sparger bracket 04. The indication was defined as deformation on the top, middle and lower brackets. The deformation was concluded to be minor and would not impact the ability of the bracket to support the sparger piping. EVT-1 of six (6) sparger pipe welds identified no indications.

	2014	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
Top Guide (Rim, etc.)	1976 to 1994	VT-3	VT-3 exam every other refueling outage per Section XI. No indications identified.
	1987	UT	UT examination performed of specific cells. No indications identified.
	1994	VT-3	Visual (VT-3) examination of 4 cells (48-41, 08-25, 24-17, and 24-25), per SIL 554. No indications identified.
	1996	VT-3	Visual (VT-3) of 2 aligner pins (0 deg. And 270 deg.), per SIL 588. No indications identified.
	2012	EVT-1	EVT-1 examinations were performed on nineteen (19) top guide cells in accordance with BWRVIP-183. No indications were identified.
Core Plate (Rim, etc.)	1996	VT-3	VT-3 examination of all accessible hold down bolts (cell 16-57, and area at 0 and 270 deg. Azimuth. No indications identified.
	2010	VT-3	VT-3 examination of 16 core plate plugs. No Indications identified.
	2012	VT-3	All 129 core plate plugs were replaced with the new design. VT-3 of nine (9) core plate bolts was performed. No indications were identified.
SLC	1992	PT	Surface (PT) examination of nozzle to safe end weld per Section XI. No indications identified.
	1998	PT & UT	PT and UT of N10 nozzle to safe-end, no indications identified.
	2002	PT	Extended dwell time Liquid Penetrant examination of entire safe end.

			No indications identified.
	2006	PT	Extended dwell time Liquid Penetrant examination of entire safe end. No indications identified
	2010	UT-E	SLC Nozzle to safe end weld. No indications identified.
Jet Pump Assembly	1976–1996	VT-3	Visual VT-3 of all jet pump components performed every other refueling outage.
	1981	VT & UT	VT and UT examination performed on all 20 hold down beams. No indications identified.
	1994	VT	Restrainer bracket wedge misalignment and wear identified on several wedges. Evaluations found condition acceptable without repair. One restrainer bracket set screw tack weld found cracked. Evaluations found condition acceptable without repair.
	1996	VT	Restrainer bracket wedge conditions and set screw tack welds remain unchanged, condition acceptable without repair.
	1998	MVT-1	MVT-1 of: RS-1 weld on all 10 risers, RS-2 & RS-3 welds on 6 of 10 risers. No indications identified.
		UT	UT of all 20 hold down beams. No indications identified.
	2000	EVT-1	EVT-1 of adjusting screw tack weld (jet pump 7) and RS-2 & RS-3 on 5 of 10 risers. No indications identified.
	2002	EVT-1	EVT-1 of fifty (50) Medium priority weld locations. EVT-1 of transition region of two (2) hold down beams. No indications identified
	2004	EVT-1	EVT-1 of forty one (41) medium priority welds, to complete 50% baseline inspections. No indications identified.

		UT	UT performed on all twenty (20) hold down beams (3 zones, BB-1, BB-2, and BB-3). No indications identified.
		VT-1	VT-1 on all twenty (20) Inlet Mixer main wedges. Thirteen (13) jet pumps exhibited additional wear at main wedge-to-restrainer bracket interface. Performed expanded scope of inspections on these jet pumps. Set screw gaps identified at five (5) jet pumps. No additional problems identified. Installed eight (8) slip joint clamps and three (3) set screw auxiliary spring wedges, to mitigate wear believed to be caused by vibration.
	2006	VT-1, EVT-1, VT-3	VT-1 of twenty (20) WD-1 locations. EVT-1 of five (5) IN-4 welds, and two (2) riser braces-to-vessel attachment welds. VT-3 of eight (8) Slip Joint Clamps and three (3) Auxiliary Spring Wedges. Expanded EVT-1 scope on three (3) jet pumps due to WD-1 findings.
	2008	UT	UT exams performed on all 20 jet pump hold down beams. No indications identified.
		VT-3	Visual inspections performed on 5 auxiliary spring wedges installed. No indications identified.
		EVT-1	EVT-1 of 50 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Expanded EVT-1 scope on one jet pump due to WD-1 findings.
		VT-1	VT-1 of twenty (20) WD-1 locations. Re-examined previously identified wedge wear with no apparent changes noted on 19 of 20 inspections. One main wedge had additional wear into the restrainer

			bracket. BWRVIP 41 expanded scope inspections were performed with no additional indications identified. One Slip joint clamp was installed on the affected Jet Pump.
	2010	VT-3	VT-3 of two slip joint clamps. No indications identified
		VT-1	VT-1 of all twenty (2) JP main wedges. No new/additional wear identified. VT-1 of all JP set screws for gaps. Minor gaps identified on seven JPs. Five (5) accepted for continued service by engineering analysis. Two (2) were corrected by tapping down on the main wedge.
		EVT-1	EVT-1 of 37 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Completed BWRVIP Letter 2009-202 required inspections.
	2012	VT-3	VT-3 of seven slip joint clamps. Minor wear detected on JP 15 slip joint clamp. Wear was acceptable for continued use and will be re-inspected next outage.
		VT-1	VT-1 of all twenty (20) JP main wedges. New wedge wear identified on JP 16 and accepted for continued use. New wedge rod wear identified and accepted for continued use on JPs 1, 2, 5, 10, 11, 12, 14, 17 and 20. VT-1 of three (3) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. VT-1 of set screw gaps were performed on seven (7) JPs. Five of the jet pumps had minor gaps which were acceptable for continued use by an engineering analysis.

		EVT-1	EVT-1 of 20 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser pipe to transition piece weld, riser brace leaf to RPV Pad Weld, riser pipe to restrainer bracket circumferential weld and the bottom of the nozzle casting to the top of the mixer assembly weld (IN-4). No indications identified.
	2014	VT-3	VT-3 of nine (9) slip joint clamps. Minor wear detected on JP 05 and JP 15 slip joint clamps. Wear was acceptable for continued use and will be re-inspected next outage. New slip joint clamps were installed on JP 16 and JP 20 as a result of new wear on the belly band, and restrainer bracket.
		VT-1	VT-1 of all twenty (20) JP main wedges. Slight new wedge wear identified on JP 16 and accepted for continued use. The wedges on the bottom side on JPs 13 and 16 appeared to be lower. New wedge rod wear identified and accepted for continued use on JPs 06, 13 and 20.
		VT-1	VT-1 of eight (8) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. The auxiliary wedges on JPs 10 and 18 were found in the over-travel and were replaced. The aux. wedge on JP20 was also found in the over-travel position and a slip join clamp was installed which resulted in no set screw gaps. Both aux wedges on the shroud side and vessel side on JP 20 were then removed.
		VT-1	VT-1 of set screw gaps were performed on jet pumps without a slip joint clamp or auxiliary wedge. All as-left gaps were acceptable for continued use and none exceeded the 0.010" criteria for installation of an auxiliary wedge.

	2016	VT-1	VT-1 of four (4) slip joint clamps. Minor wear detected on JP 05 SJC. Wear was acceptable for continued use.
		VT-1	VT-1 of (20) main wedges. New wedge rod wear identified on JP 03, 13 and 16 and accepted for continued use. The wedges on JPs 12, 14 and 20 appeared to be lowered.
		VT-3	VT-3 of three auxiliary wedges. Minor wear identified on JP 13 and 18 aux wedges and accepted for continued use.
		EVT-1	EVT-1 of 28 medium and high priority welds including riser pipe to riser brace welds, riser elbow to thermal sleeve, inlet and mixer connections, riser elbow to riser pipe welds etc. A 1 5/8" flaw was noted on JP11/12 RS-1 weld and was accepted as is with re-inspection next outage in 2018.
Jet Pump Diffuser	1998	MVT-1	MVT-1 of: AD-1 & AD-2 welds on 12 of 20 pumps, AD-3A & B welds on 11 of 20 pumps, and DF-2 weld on 10 of 20 pumps. No indications identified.
	2000	EVT-1	EVT-1 of AD-1, -2, -3a, -3b, and DF-2 on jet pumps 1 through 10. No indications identified.
	2002	EVT-1	EVT-1 of ten (10) High priority weld locations. No indications identified.
	2004	EVT-1	EVT-1 of eleven (11) medium priority weld locations, to complete 50% baseline inspections. No indications identified
	2006	UT	UT of ninety eight (98) Diffuser / Adapter welds and six (6) Inlet Mixer welds. One 2" indication found on DF-2 weld, JP 17. Structural and leakage evaluations found indication acceptable for continued service.

	2010	EVT-1	EVT-1 of JP 17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified.
	2012	EVT-1	EVT-1 of JP-17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified. This examination was a recommendation from the 2012 BWRVIP INPO review visit.
	2016	EVT-1	EVT-1 of (60) Diffuser / Adapter welds. Indications were identified on (11) Jet Pumps out of 20 AD-3a/b backing ring. Largest indication on JP03 ~3.6 inches. Indications were acceptable as is with re-inspection next outage.
		EVT-1	EVT-1 of JP-17 DF-2 weld from the OD to look for any visual indication of the flaw identified by UT in 2006. 40% coverage of the OD was achieved, all suspect areas were investigated and no indication was identified.
CRD Guide Tube	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified
	2002	EVT-1, VT-3	EVT-1 of three (3) welds on each of ten (10) Guide Tubes (locations 50-31, 42-11, 42-23, 42-51, 38-27, 38-35, 38-51, 34-23, 34-39, and 30-31). Some flow interference with examinations. VT-3 equivalent of anti-rotation pin on ten (10) Guide Tube locations. No indications identified
	2006	EVT-1, VT-3	EVT-1 of fifteen (15) CRGT welds, VT-3 of five (5) CRGT welds, verification of seventeen (17) CRGT alignment pins. One slightly bent pin identified. Pin remains functional. Condition found acceptable. No other indications identified.

	2008	EVT-1	EVT-1 of nine (9) CRGT welds. No indication identified. Also, verification of eight (8) CRGT welds and (8) CRGT alignment pins.
	2010	EVT-1	EVT-1 of four (4) CRGT welds. No indications identified. All BWRVIP-47 baseline examinations have been completed.
CRD Stub Tube	1992	VT-3	VT-3 examination of stub tube welds accessible from fuel cells 26-31 and 30-27. No indications identified.
In-Core Housing	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
Dry Tube	1984		All Dry Tubes replaced in 1984
	1994	VT-1	VT-1 examination of IRM Dry Tube 2D, at core location 37-32.
	1997	N/A	All IRM and SRM tubes replaced w/ Wide Range Monitoring tubes in 1997. No inspections required.
	2016	N/A	The 1997 WRNM replacement left four dry tubes as spares, with no detector installed. All four spare dry tubes were replaced in 2016.
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.
LPCI Coupling			N/A for this plant
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 per ASME Section XI. No indications identified.
	2000	EVT-1	EVT-1 of six (6) Core Spray piping brackets. No indications identified.
	2002	EVT-1	EVT-1 of two (2) Core Spray piping brackets, two (2) Steam Dryer support

			brackets, and five (5) Jet Pump Riser brackets attachment welds. No indications identified.
	2004	EVT-1	EVT-1 of two (2) Steam Dryer support brackets and three (3) Jet Pump riser brace attachment welds.
		VT-3	VT-3 of four (4) Steam Dryer hold down brackets and three (3) lower surveillance brackets. No indications identified.
	2006	EVT-1, VT-3, VT-1	EVT-1 / VT-3 of twelve (12) Feedwater Sparger attachment bracket welds. EVT-1 / VT-1 of two (2) Jet Pump riser brace-to-vessel welds. No indications identified. Minor anomalies incidentally identified on several FW Sparger bracket pins.
	2008	VT-3	VT-3 of 5 Feedwater Sparger end brackets and attachment pins
		EVT-1	EVT-1 of 2 Core Spray bracket attachment welds
	2012	VT-3	VT-3 of 6 feedwater sparger end brackets and attachment pins. Wear identified on 5 of the 6 feedwater spargers end brackets and/or attachment pins. Wear was acceptable for continued use.
		EVT-1	EVT-1 of 8 Core Spray bracket attachment welds. No recordable indications. EVT-1 of 4 steam dryer support brackets. No recordable indications.
	2014	EVT-1, VT-1, VT-3	EVT-1/ VT-3 of four (4) Steam Dryer support brackets. New wear was observed at locations 094 and 274 deg and acceptable with engineering evaluation. Previously noted wear was observed on 004 and 184 deg with no changes. EVT-1 of four (4) Jet Pump Riser brackets attachment welds. No indications identified.

			VT-1 of three (3) lower surveillance brackets. No indications identified.
	2016	VT-3 EVT-1	EVT-1/ VT-3 of four Steam Dryer support brackets. New wear was observed at all locations and acceptable with engineering evaluation. The wear is consistent with the new footprint of the replacement dryer versus the OEM dryer, with the 40% increase in weight. EVT-1 of (3) Jet Pump Riser brackets attachment welds. No indications identified. EVT-1 of 2 Feedwater sparger end brackets and attachment pins. Wear identified was acceptable for continued use.
Steam Dryer	2002	VT-1, VT-3	VT-1 of all drain channel welds. VT-1 of upper and lower dryer bank tie bar welds and baffle plate welds. VT-3 of dryer bank end and top covers, and instrument tubing and supports. One (1) central bank upper tie bar severed, and one (1) instrument tube support-to-baffle plate broken. Broken tie bar and instrument tube removed from dryer. New, stiffer tie bars welded to central dryer banks.
	2004	VT-1	VT-1 of five (5) replaced central bank upper tie bars, ten (10) original bank upper tie bars, and outer bank hoods @ internal reinforcing plates and end plate welds, per SIL 644, Supp.1. No indications identified.
	2006	VT-1	Completed all remaining BWRVIP-139 recommended inspections on seventy four (74) locations. One small indication (7/16") identified at base of drain channel vertical weld. No other indications identified.

	2008	VT-1	Re-examined small indication (7/16") identified at base of drain channel vertical weld. No change noted. No other indications identified.
	2010	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A re-examination of (six) key high stress (red) locations and five (5) tie bars. No indications identified. Examination of all four (4) lifting lugs. Indications identified on anti-rotation tack welds. Accepted continued service by engineering evaluation.
	2012	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A examination of eight high stress (red) locations and seven (7) tie bars. No indications identified in high stress locations. Existing deformation was identified in two of the tie bars and was accepted for continued service by an engineering evaluation. Examination of all four (4) lifting rod assemblies identified existing indications on each lifting rod assembly. These indications were accepted for continue service by engineering evaluation.
	2014	Replace-ment	As part of the EPU License Amendment Request (LAR), Exelon PBAPS replaced the Original Equipment Manufacturer (OEM) steam dryer with a 3-ring octagonal (Nordic style) Westinghouse dryer.
	2016	VT-3	General VT-3 as found was performed on: - Top and sides (incl. outside of skirt) - underside of RSD (incl. inside of skirt) - W and U channel guides - hold down rods and lifting rods - outer, middle and inner hoods - and support ring.

		VT-1	VT-1 of (71) recommended locations by the manufacturer. Indications were identified at bottom of the hold down rods on construction/ non-structural welds for all (4) HDRs and evaluated as acceptable as is with no repair. The welds will be reinspected next outage in 2018. No other indications identified.
Steam Separator	2006	VT-1	VT-1 examinations performed on a sample of upper and lower shroud head bolt support ring gussets. 12 of 24 lower ring gussets revealed degradation. No indications on upper support ring gussets. Indications acceptable for continued service.
	2008	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. 5 of 12 lower ring gussets with previously identified degradation had further crack growth and 4 lower gussets had new indications not previously identified. No indications were observed on the upper support ring gussets. All Indications are acceptable for continued service.
	2010	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. Slight growth at one previously identified indication. New indication identified on six (6) gussets. All new indications were minor and acceptable for continued service. Wear identified on one (1) shroud head bolt pin/window. SHB was removed.
	2012	VT-1	VT-1 examinations were performed on all mid support ring gussets with new indications identified. These indications were acceptable for continued service based on an engineering evaluation. VT-1 examinations were performed on three shroud head bolts with indications identified on all three.

			VT-1 of four upper support ring gussets revealed no indications. VT-1 of all four lifting lug assemblies revealed existing indications on all four assemblies. These indications were acceptable for continued service as a result of an engineering evaluation.
	2014	VT-1	VT-1 examinations were performed on all (24) mid support ring gussets with (4) new indications identified. These indications were acceptable for continued service based on an engineering evaluation.
		VT-3	VT-3 examinations were performed on all (31) shroud head bolts with indications identified on (13) SHB. These indications were acceptable for continued service based on an engineering evaluation. Three (3) new SHB were installed as part of EPU.
		VT-1	VT-1 of four upper support ring gussets revealed no indications and VT-1 of all four lifting lug assemblies revealed previously identified indications on all four assemblies with no changes.
	2016	VT-3	VT-3 of (5) shroud head bolts.
		VT-3	VT-1 of (4) upper support ring gussets and (8) middle ring gussets revealed indications that were acceptable for continued service based on an engineering evaluation.
		VT-1	VT-1 of all four lifting lug assemblies revealed previously identified indications with no changes.
Dissimilar Metal Welds (BWRVIP-75-A)	2008	UT-E (E = encoded)	Performed Manual UT on three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was not ID connected and determined to be a fabrication flaw after comparison to

			construction radiographs. Indication was found acceptable, no further analysis or repairs required.
	2010	UT-E	Performed Manual UT of three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. No indications were identified.
	2012	UT-E	Performed Manual UT of six (6) IGSCC Category D welds. Three of these welds were dissimilar welds. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was evaluated per the requirements of Table IWB-3514-2 of ASME Section XI and was found to be acceptable.
	2014	UT-E	Performed Manual UT of one IGSCC Category D dissimilar weld, 3-I-19R (RPV, Nozzle N9 to Cap). No indications were identified.
	2016	UT-E	Performed Auto UT of (3) IGSCC Category D DM weld and Manual UT of one IGSCC Category A DM weld. No indications were identified.

BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Fall 2016 Outages

June 2017

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Reactor Internals Inspection History

Plant: **Browns Ferry Nuclear Plant: Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	2005	UT	Baseline: UT (two-sided) examination of H1, H2, H3, H4, H5, H6, H7 performed per BWRVIP-76. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 83.0% / 0.0% H1 / Lower / 82.1% / 2.1% H2 / Upper / 81.8% / 0.4% H2 / Lower / 88.7% / 0.0% H3 / Upper / 88.7% / 0.0% H3 / Lower / 79.2% / 5.1% H4 / Upper / 90.0% / 20.1% H4 / Lower / 89.6% / 2.6% H5 / Upper / 91.3% / 1.2% H5 / Lower / 91.3% / 0.0% H6 / Upper / 91.9% / 0.0% H6 / Lower / 91.9% / 11.2% H7 / Upper / 91.4% / 12.0% H7 / Lower / 78.0% / 0.0%
	2016	UT	Reinspection per BWRVIP-76, UT (two-sided) examination of H1-H7; Baseline per BWRVIP-76, UT examination of V3 and V4. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 84.6% / 0.0% H1 / Lower / 87.8% / 1.2% H2 / Upper / 87.9% / 0.3% H2 / Lower / 87.0% / 0.0% H3 / Upper / 86.8% / 0.0% H3 / Lower / 86.9% / 5.8% H4 / Upper / 97.5% / 23.4% H4 / Lower / 98.3% / 4.8% H5 / Upper / 92.1% / 0.0% H5 / Lower / 92.7% / 0.0% H6 / Upper / 93.2% / 0.0% H6 / Lower / 100.0% / 4.2% H7 / Upper / 100.0% / 2.4% H7 / Lower / 100.0% / 0.0%

			V3 / CCW Side / 96.5% / 0.0% V3 / CW Side / 88.7% / 0.0% V4 / CCW Side / 87.8% / 0.0% V4 / CW Side / 87.7% / 0.0%
Shroud Support	2005	VT-1, VT-3	Access Hole Cover Welds at 0° and 180°: Replacement required prior to Unit 1 Restart - Both access hole covers replaced with bolted repair design per DCN 51193. VT-1 visual baseline exam performed to inspect nut to retainer tack welds only. VT-3 visual baseline exam performed to document the as-left condition of the AHCs. No relevant indications on either cover.
		EVT-1	Baseline inspection per BWRVIP-104 of the H8 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. No relevant indications.
		EVT-1, UT	Baseline inspection per BWRVIP-104 of the H9 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. Also performed UT from the outside surface of the RPV obtained from access of the N1A and N1B (Recirculation outlet nozzles) windows. Achieved coverage was calculated to be 19%. No relevant indications.
		VT-3	Baseline inspection per BWRVIP-104 of the H10 and H12 welds at 0 and 180 degrees. These inspections were performed through the access hole cover openings during the repair. No relevant indications.
	2008	VT-3	VT-3 visual inspection of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and

			the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
	2012	EVT-1	Reinspection of Shroud Support weld H-8 (EVT-1) at 0° and 180° per BWRVIP-38. No reportable indications were found.
	2016	EVT-1	Reinspection of Shroud Support weld H-9 (EVT-1) per BWRVIP-104. No reportable indications were found. Visual inspection per BWRVIP-180 (VT-1 from the top surface) and vendor recommendation (VT-3) of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
Core Spray Piping	2001	UT	Baseline inspection per BWRVIP-18: UT of T-Box welds @ 120 (P2) and 240 degrees (P2, CP3). UT of elbow and sleeve welds for Downcomers A through D (P4a, P4b, P4c, P5, P6, and P7). No relevant indications.
	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations (T-Box welds @ 120 (P1, AP3, BP3) and 240 degrees (P1, DP3), Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees). EVT-1 visual examinations of elbow and sleeve welds for Downcomers A through D (P4d, P8a, P8b). No relevant indications.
	2008	EVT-1	Reinspection per BWRVIP-18-A: EVT-1 visual inspections of T-Box Welds (P1 (120° & 240°), AP3, BP3, DP3) and Downcomer Welds (AP4d, A-D8a, A-D8b); no relevant indications were observed.
	2010	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds

			@120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. UT of elbow and sleeve welds (P4a, P4b, P4c, P4d, P5, P6, P7, P8a, & P8b) performed for Downcomers A through D. Two indications (1.04" and 2.20") observed on weld P4a on A Downcomer on the pipe side of the weld. Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R9 (2012). Supplemental EVT-1 visual inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2012	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
	2014	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees); no relevant indications were observed. UT of elbow weld P4a performed for Downcomer A and elbow welds P4a, P4b, P4c, & P4d performed for Downcomer B. Two indications observed on Weld P4a on Downcomer A were resized (0.40" and 2.37") and two additional indications were identified (0.52" and 0.23"). Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R11 (2016). UT of sleeve welds (P5, P6, P7, P8a, & P8b) performed for Downcomers A through D; no relevant indications were observed. Supplemental EVT-1 visual

			inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2016	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
Core Spray Sparger	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations of sparger welds (S1, S2, S4). BS2-R weld @ 9 degrees (Sparger to T-Box Weld, R side (Lower Sparger) recorded a crack adjacent to the weld and was structurally replaced by weld repair clamp per DCN 51193. AS2-R weld @ 354 degrees (Sparger to T-Box Weld, R side (Upper Sparger) recorded a pin hole adjacent to the weld and evaluated as "accept as is". Otherwise, no relevant indications.
		VT-1	Baseline inspection per BWRVIP-18: VT-1 visual examinations of sparger welds (S3a, S3b, S3c, Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees). No relevant indications.
	2008	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger welds (S1, S2, and S4) and VT-1 visual examinations of Sparger welds (S3a, S3b, and S3c) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2012	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger A, C, D welds (S1 and S2 [L & R]), and Sparger A, B, C, D welds (S4 [L & R]) and VT-1 visual examinations of Sparger A, B welds (S3a, S3b, and S3c [L & R]) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2016	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
Top Guide (Rim, etc.)	2005	VT-3	Baseline inspection (NON-BWRVIP): VT-3 visual examinations of Locations 4 (Grid Beam to Rim Top / Bottom Cover Plate Pins), 6 (Fuel Guard Weld and Bolting), 12 (Rim & Cover Plate Fabrication Weld), and 13 (Eye Bolt Boss). 1 area recorded as a condition on the plate (Location 12), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1	Baseline inspection (NON-BWRVIP): EVT-1 visual examinations of Locations 1 (Grid Beam & Beam to Beam Crevice Slot) and 10 (Rim Pins). 3 areas recorded as not acceptable (Location 1), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1, VT-1	Baseline inspection per BWRVIP-26: Inspected Rim Welds (Location 11) (EVT-1) and Aligner Pins (Locations 2/3) (VT-1) at all locations. No relevant indications.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
	2014	EVT-1	Baseline (2014) per BWRVIP-183: Location 1 (Grid Beam and Beam-to-Beam Crevice Slot) inspected for ten grid beam cells; no reportable indications.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
Core Plate (Rim, etc.)	2005	EVT-1, VT-3	Baseline inspection per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were EVT-1 inspected from the top side, and seventeen (17) holddown bolts (50%) were inspected from the bottom side with no reportable indications. All one hundred twenty-nine (129) plugs (Location 13) were VT-3 inspected; three plugs were replaced.
	2008	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Three (3) core plate plugs replaced during Unit 1 Recovery were VT-3 examined to confirm that the replacement plug was in place. No evidence of movement, wear, or misalignment was visible.
	2010	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2012	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2014	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2016	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
SLC	2007	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.

	2008	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
	2014	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
		UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
Jet Pump Assembly	2005	UT, VT-1	Baseline (2006) per BWRVIP-41, -138: UT of holddown beam locations BB-1, BB-2, and BB-3 (Jet Pumps 1 thru 20) - no reportable indications. Baseline (2005) per BWRVIP-41 of all High and Medium Priority Weld locations. Circumferential crack indication in backing ring for DF-3 weld (Jet Pump 19) will be inspected for change during U1C7 RFO in Nov. 2008.

			Baseline (2005) per BWRVIP-41: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); No wedge wear observed. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified nine (9) set screw gaps ranging from 12 to 35 mils in width. Two reportable linear indications identified on one of two set screw tack welds for Jet Pump Nos. 15 (shroud-side) and 16 (vessel-side). Nine (9) auxiliary wedges installed on Jet Pumps 2, 3, 4, 6, 7, 8, 10, 12, and 14.
	2008	VT-3	VT-3 visual examination of the holddown beam for Jet Pump #8 was performed in response to misalignment concerns raised during Unit 1 Recovery and an RFI identified during the October 2007 INPO BWRVIP Review Visit. There was a minor misalignment with the beam but no relevant indications were observed. VT-3 visual examination of sensing line clamps installed during Unit 1 Recovery on Jet Pumps 1-5 and 11-15 performed to confirm that all of the repair hardware is in place and that the hardware has not shifted or changed from the as-installed condition. No relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was previously recorded during Unit 1 Recovery and does not appear to have changed.
		VT-1	Reinspection per BWRVIP-41 R1: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted. Indication of vertical wedge movement at ten (10) locations was observed, but the movement markings did not appear to be recent and correlated

			with findings during the Unit 1 Recovery examinations. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified no new set screw gaps. Inspection results identified eight apparently new set screw tack weld indications in addition to the two set screw tack weld indications that were previously observed during Unit 1 Recovery. Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery were inspected to verify contact; no relevant indications were observed.
	2010	EVT-1	Reinspection per BWRVIP-41, Rev. 3: EVT-1 of Medium Priority Locations RS-8 and RS-9 (Jet Pumps 1 thru 20) performed in accordance with BWRVIP Letter No. 2009-202 ("Interim Guidance for Accelerated Inspections of Jet Pump Riser to Riser Brace Welds and Wedges"); no relevant indications.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was unchanged from U1R7.
		VT-1	Reinspection per BWRVIP-41 R3: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted; three new instances of minor wedge wear since U1R7 noted at Jet Pumps 1, 6, and 10 determined to be the result of routing service during operation. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified one new set screw gap (Jet Pump 20: Shroud-Side Set Screw - 17 mils). Evaluation performed to provide one fuel cycle (U1C9) of continued operation.

			Inspection results identified two apparently new set screw tack weld indications on Jet Pump 17 in addition to the nine set screw tack weld indications that were previously observed during U1R7 (NOTE: An indication that was identified during U1R7 for Jet Pump 14 was accidentally counted twice). Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle (U1C9).
	2012	UT, EVT-1, VT-1	Reinspection per BWRVIP-41 R3, -138 R1: UT of holddown beam locations BB-1 and BB-2, (Jet Pumps 1 thru 20) - no reportable indications. Reinspection per BWRVIP-41 R3: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, & RS-7 (Jet Pumps 1 thru 6); IN-4, MX-2, & DF-1 (Jet Pumps 1 thru 5); no reportable indications. EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, & AD-3b (Jet Pumps 1 thru 10); linear indication (0.5 inches long) observed in heat-affected zone above the AD-1 weld for Jet Pump 6 was evaluated using Jet Pump Flaw Evaluation Handbook and was deemed acceptable. Otherwise, no reportable indications. EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. An additional indication was observed when a stain was reclassified; both indications were unchanged from U1R8, however. VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on five jet pumps (Jet Pumps 1, 10, 12, 17, & 18);

			significant increase in wedge wear for Jet Pump 6 necessitated a repair (aux wedge installed on the Shroud-Side Set Screw (SS-SS) for Jet Pump 6 to stabilize the restrainer bracket assembly); RS-8 and RS-9 welds for Jet Pump 6 examined (EXPANDED SCOPE) to insure no degradation was present - no recordable indications.
	2012	VT-1	VT-1 performed of Set Screw Locations AS-1 and AS-2 for Jet Pumps 1 thru 20. Backlighting identified three (3) set screw gaps (1 existing and 2 new) one of which (SS-SS for Jet Pump 18) measured at 9 mils and the other two (Vessel-Side Set Screw) VS-SS for Jet Pump 17 & SS-SS for Jet Pump 20) each measured at 20 mils, which exceeded the 15-mil screening criteria for installation of an auxiliary spring wedge but did not exceed the 20-mil criteria above which the potential exists for high level jet pump vibration. Gaps were corrected by tapping down on main wedge, so no additional auxiliary wedges installed. 17 set screw tack weld indications (11 existing and 6 new) were identified during U1R9. SS-SS on Jet Pump 17 was found backed out to shroud wall due to tack weld failure. SS-SS was restored to its original position and repaired (staked and an aux wedge added). Four additional set screws (Jet Pump 11 VS-SS, Jet Pump 13 SS-SS, Jet Pump 15 SS-SS, and Jet Pump 16 VS-SS) were found to have both tack welds broken and were staked and an aux wedge added. Remaining set screws had only 1 of 2 set screw tack welds and were acceptable as-is.
	2014	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on nine jet pumps (Jet Pumps 1, 6, 8, 9, 10, 12, 16, 17, & 18. Observed downward movement of the wedge for Jet Pumps 9

			& 12 led plant to conservatively inspect unrepaired adjusting set screws for both pumps – no reportable indications; minor wedge wear on all other jet pumps was unchanged. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery and six (6) auxiliary spring wedges installed during U1R9 (2012) were inspected to verify contact; no relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; indication was unchanged from U1R9 in 2012. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R9 in 2012.
	2016	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); indications of minor wear on nine jet pumps (Jet Pumps 1, 2, 5, 6, 9, 10, 12, 16, & 17). Adjusting set screws (AS-1 and AS-2) for five jet of the pumps (1, 2, 6, 9, & 10) conservatively added to scope to ensure no vibration-related damage was occurring; no set screw gaps nor new tack weld cracking observed; no slip joint clamps were required to be installed.

			3gaps observed during last set screw gap inspection during U1R9 were reinspected (Jet Pump 17, VS-SS - no gap observed; Jet Pump 18, SS-SS - no gap observed; Jet Pump 20, SS-SS - 13-mil gap); no aux wedges were required to be installed. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Four (4) auxiliary spring wedges inspected as part of expanded scope had relevant indications, so all 15 aux wedges installed on Unit 1 were inspected. 14 of 15 wedges had minor wear but none was judged serious enough to prevent wedges from performing their design function.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed during U1R9 & U1R10 in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; after cleaning the indication was re-identified as a scratch. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R10 in 2014 and upon evaluation were determined to be acceptable for one fuel cycle.
Jet Pump Diffuser	N/A	N/A	Diffuser exams reported in above jet pump assembly inspection results.

CRD Guide Tube	2005	EVT-1, VT-3	Baseline per BWRVIP-47: 19 control rod guide tubes (10% of total) examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual examination of Locations CRGT-2 and CRGT-3; no reportable indications.
CRD Stub Tube	2005	VT-3	VT-3 examinations performed for accessible areas for 145 stub tubes at various core locations. No damage or distortion was noted.
In-Core Housing	N/A	N/A	N/A
Dry Tube	2006	VT	All twelve (12) SRM/IRM dry tubes replaced with modified design which is resistant to cracking. Inspections will be scheduled after dry tubes have reached the expected 20-year life (2027).
Instrument Penetrations	2007	VT-2	Visual leak check is performed during Unit Startup. No reportable indications reported.
	2008	VT-2	Visual leak check performed during Unit Startup. Leak observed in safe-end to pipe weld for N11B instrumentation nozzle was repaired with weld overlay.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2014	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.

		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
			Visual leak check performed during Unit Startup. No relevant indications reported.
Feedwater Sparger	2005	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications.
			VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2008	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2010	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor impact damage observed on 175° Bracket (acceptable as-is), but otherwise no relevant indications were observed (no pin wear).
	2012	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor wear observed under the retaining pin for the end bracket at one new location (55°) when compared to U1R8 (2010) inspection results. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R10 in 2014 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of

			any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R8.
	2014	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications.
		VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R11 in 2016 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R9 in 2012.
	2016	VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R12 in 2018 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R10 in 2014.
Vessel ID Brackets	2005	EVT-1	Jet Pump Riser Brace Welds (40) examined (EVT-1): No recordable indications.

			Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): Damage to upper right corner and an indication extending from the damaged corner of the dryer support bracket located at 274° was repaired during Unit Recovery. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications.
	2012	EVT-1	Jet Pump Riser Brace Welds (12, Jet Pumps 1-6) examined (EVT-1): No recordable indications.
	2014	EVT-1	Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications.
	2016	EVT-1	Jet Pump Riser Brace Welds (Jet Pumps 7-20) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): No recordable indications. Attachment weld at 184° only received a VT-3 examination due to heavy crud buildup and will be cleaned and inspected to the proper exam method during U1R12 in 2018. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications. Guide Rod RPV Attachment at 0°: Indication on tack weld at the upper guide bracket to the Guide rod observed during Section XI Code examination.
LPCI Coupling	N/A	N/A	Not applicable to this plant

Steam Dryer	2005	VT-1	Full baseline inspection performed in accordance with BWRVIP-139 and GE SIL 644 R1. Three Drain Channel Vertical Welds were found to have indications, and were repaired with weld overlays.
	2008	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were VT-1 visually examined and confirmed. No change in condition was noted from what was previously reported. General visual inspection (pre-EPU baseline) performed in accordance with BWRVIP-139 and GE SIL No. 644 R1; no relevant indications were observed.
	2008	VT-1	In preparation for ascension to EPU and operation at EPU conditions, various steam dryer modifications were performed. All thirteen (13) Steam Dryer Tie-Bars were replaced with a new design and three (3) additional steam dam gussets on each steam dam were added to the Steam Dryer. A visual (VT-1) inspection was performed to document the as-left condition.
	2010	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R7.
	2012	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R8. Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed

			condition; no relevant indications were observed.
	2014	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R9 (2012).
	2016	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R10 (2014). Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed condition; no relevant indications were observed. Four (4) BWRVIP-139-A "Red Welds" (welds associated with dryer integrity) were visually inspected (VT-1). Three of the welds were found to have been removed during U1R7 modifications, the fourth had no relevant indications when examined.
Steam Separator	2010	VT-3	Steam Separator tie bars (cross bracing) examined for signs of cracking (Reference: INPO OE 30657). No relevant indications were observed on the cross bracing, but a minor dent was recorded at the top of a standpipe located in the southeast corner of the separator that was acceptable as-is.
DM Welds - BWRVIP-75-A Cat. C	2008	UT	3 welds inspected (RCRD-1-33, CS-1-002-008, CS-1-002-033A): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).

	2012	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R10).
	2016	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R11).
DM Welds - BWRVIP-75-A Cat. D	2008	UT	2 welds inspected (DRHR-1-2, DRHR-1-11): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).
	2012	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 10 (U1R10).
	2016	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 11 (U1R11).

Reactor Internals Inspection History

Plant: **Cooper Nuclear Station**

Component in BWRVIP Scope	Date of Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud	Fall 1995 (RE15)	UT	Baseline UT performed on welds H1 through H7 per BWRVIP guidelines. Indications identified in 4 circumferential welds. No examinations on vertical welds. No repair required.
	Spring 2005 (RE22)	UT	UT examinations were performed on welds H-1 through H-4 including a portion of vertical weld V16. Examination of welds H5-H7 was deferred to fall 2006. Single sided UT examinations were performed on welds H-1 through H-3 with welds H-4 and vertical weld (V-16) receiving dual sided examinations. Percentage of welds examined: H1 (54.9%), H2 (55.7%), H3 (63.9%), H4 (58.4%). The previously identified eight (8) flaws in H1 showed a net decrease in length. No new flaws in H2 were identified. The eight (8) flaws in H3 were reexamined with one (1) new flaw identified for a total increased change in flaw length relative to total weld length of 7.5 %. Two (2) new minor flaws were discovered in the HAZ of H4. In addition, a total of eleven (11) minor indications were identified in the base metal adjacent to H4. Six (6) of the indications exhibited characteristics associated with Stress Corrosion Cracking (SCC) in areas subjected to cold working during the shroud fabrication/installation process. The remaining five (5) indications did not exhibit characteristics of SCC but appeared to exhibit characteristics commonly observed from localized attachment removal sites. The indications were determined to be acceptable by analysis. No indications were observed in the vertical weld.

	Fall 2006 (RE23)	UT	UT examinations were performed on welds H5, H6a, H6b, and H7 using phased array. Two (2) sided examinations were performed on all welds except H7 that received a one-sided UT examination. Coverage was estimated at greater than 72% for welds H5, H6a, and H6b. H7 received greater than 53% coverage. A previously identified indication in H5 was re-examined with no apparent change. A previously identified indication in H6a was re-examined with no apparent change. A new minor indication was discovered in weld H6b in an area previously scanned in RE16 (1995). Two (2) new minor indications were discovered in weld H7, one in a previously scanned location and the other in an area not previously scanned.
		VT-3	VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Discovered an indication approximately ten (10) inches long behind JP-19. Analyzed as acceptable.
	Spring 2008 (RE24)	VT-3	Performed first ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Spring 2011 (RE26)	VT-3	Performed second ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Fall 2014 (RE28)	UT	UT exams were performed on the H1 thru H7 welds along with the V16 and base material flaw behind JP19. The previously identified indications showed no apparent changes in growth and none were through wall.
			VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Also performed third ASME B-N-2 VT-3 successive examination of flaw

			discovered in base metal behind JP-19. No changes in the indication.
Shroud Support/ Access Hole Covers	1993-1995	VT-3 and UT	VT-3 examinations of welds on 50% of core plate each outage. No indications. UT of access hole covers (AHC) in 1993. No indications.
	Spring 1997 (RE17)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC in accordance with GE SIL 462. No indications.
	Fall 1998 (RE18)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 of AHC's in accordance with GE SIL 462. No indications. VT-1 of gusset plate welds between 0-180° to B-N-2.
	Spring 2000 (RE19)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC's in accordance with GE SIL 462. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on 17% of the H8 and H9 welds. EVT-1 examinations on 6 gusset welds and AHC's. No indications.
		UT	UT examination of AHC's. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examinations on four (4) gusset welds. No indications.
	Spring 2005 (RE22)	UT	UT examinations on 11.7% of the H9 weld length. No indications
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations performed on approximately 16% of H8 weld length with no relevant indications. EVT-1 examinations of AHC per SIL462. No indications.

	Spring 2008 (RE24)	EVT-1	EVT-1 examinations performed on accessible lengths of welds on seven (7) gussets. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 examinations on 16.7% of the H8 weld. EVT-1 examinations on accessible lengths of welds on two (2) gussets @ 195° and 315°. No indications.
	Fall 2014 (RE28)	UT/EVT-1	UT performed on H9 with 13.4% coverage. EVT-1 performed on both AHC's. No indications.
Core Spray Piping	1980's to 1995	VT-1/VT-3	IEB 80-13 examinations of piping and welds in annulus. Three (3) indications identified in Fall 1995 outage by EVT-1. No repair required.
	Spring 1997 (RE17)	UT	UT examination of CS P8a and P8b welds. Indications on one P8a and P8b welds (first discovery). Evaluated as acceptable.
		EVT-1	EVT-1 examinations on balance of piping.
	Fall 1998 (RE18)	UT	UT examinations on the P8a and P8b indications were re-examined.
		EVT-1	Balance examined by EVT-1. No visual indications.
	Spring 2000 (RE19)	UT	UT examinations on P8a and P8b welds with indications. No repair required.
		EVT-1	EVT-1 of P3, P4, P5, P6, and P7 welds. No visual indications.
	Fall 2001(RE20)	UT	UT examinations on P3's, three (3) P4's, P5's, P6's, P7's, P8a's and P8b's. EVT examinations of thirty-one of the CS piping welds.
		EVT-1	EVT-1 examinations on fifteen (15) welds. Indications re-examined on P8a weld and P8b welds.
	Spring 2003 (RE21)	UT	UT examinations on all P8a and P8b welds. Identified three (3) flaw indications on one P8b weld and one (1)

			flaw indication on one P8a weld. No change in length.
		EVT-1	EVT-1 examinations on both junction box covers and accessible portions of both P1's, 2 - P2's, 4 - P3's, 1-P4a , 1-P4b, 1-P4c, 1-P4d. EVT-1 all P8a and P8b welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations of both P1's . The examination revealed that the P1 weld is not a creviced weld based on the presence of an external weld on the tee box near the nozzle thermal sleeve. EVT-1 examinations were performed on both P2 welds, the four (4) P3 welds, the 4a – 4d welds at 190° , the P5's, P6's, and P7's, the four (4) P8a's, and four (4) P8b's.
	Fall 2006 (RE23)	UT	UT examinations of P8b welds. Previous indications showed no change in size.
		EVT-1	EVT-1 examinations of piping welds and bracket attachment welds. No new relevant indications observed.
	Spring 2008 (RE24)	EVT-1	EVT-1 of indication near P1 at 90°. No change. EVT-1 of P1 at 270°. EVT-1 of P2's and P3's at 90° and 270°. EVT-1 of P4a, -b, -c, and -d at 170° EVT-1 of P5's, P6's, and P7's at 10°, 170°, 190°, and 350°.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations near P1welds at 90° and 270°. No change with the indication near the P1 at 90° (Loop A). EVT-1examinations of the four (4) P3, P5, P6 and P7 welds, EVT-1 examinations of downcomer welds P4a, P4b, P4c, and P4d at 10° . EVT-1 examinations of four (4) P8a and P8b welds. No change with visual indication of P8b at 10°.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.

	Spring 2011 (RE26)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° (Loop A). No change to the indication. EVT-1 of area adjacent to P1weld at 270°. No indications. EVT-1 of the P2 welds at 90° and 270°. EVT-1 of the four (4) P3, P5, P6, and P7 welds. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 190°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a, & P3b @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. No indications. EVT-1 of area adjacent to P1weld at 270° on B Loop,. No indications. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 350°. No indications. Loops A & B, EVT-1 of the bracket attachment welds PB @ 30°, 150°, 210°, and 330°. No indications.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.
	Fall 2014 (RE28)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a & P3b welds @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 170°. No indications observed.

			Loop B EVT-1 of area adjacent to P1weld at 270°. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. No indications observed.
	Fall 2016 (RE29)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 10°. No indications EVT-1 of two (2) P8a and two (2) P8b welds at 10° and 170°. No change with visual indication of P8b at 10°. Loop B EVT-1 of two (2) P8a and two (2) P8b welds at 190° and 350°. No indications.
Core Spray Sparger	1980's to 1995	VT-1/UT	IEB 80-13 of welds on sparger. No indications.
	Spring 1997 (RE17)	EVT-1	EVT-1 examinations of sparger welds and brackets per BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C identified. No other indications.
	Fall 1998 (RE18)	EVT-1	EVT-1 examinations of sparger welds and brackets inspected in accordance with BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C was reconfirmed. No other indications.
	Spring 2000 (RE19)	EVT-1	EVT-1 examinations of sparger and brackets. Five (5) indications evaluated as acceptable.
	Fall 2001 (RE20)	VT-1	VT-1 of 25% of S3a, S3b, and S3c welds. No indications.
		EVT-1	EVT-1 examinations of all S1, S2, and S4 welds examined with no indications.
	Spring 2003 (RE21)	VT-1	VT-1 of 25% of S3a & S3b's and all bracket welds. No indications.

		EVT-1	EVT-1 examinations of two S1,s, two S2,s, both XTRW welds near t-boxes, and four (4) S4 welds. No indications.
	Spring 2005 (RE22)	N/A	Sparger examinations deferred to fall 2006 (RE23).
	Fall 2006 (RE23)	VT-1	VT-1 on 50% of the S3a, S3b, and S3c welds and 100% on sparger brackets. No indications.
		EVT-1	EVT-1 on 100% of S1's and S2's and S4's. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 90°, 92°, 119°, 149°, 210°, 241° and 268°.
		EVT-1	EVT-1 examinations of S1's and S2's at 170° and 190°. EVT-1 examinations of S3a, S3b at 92° to 269°. EVT-1 examinations of S3c at 99°. EVT-1 examinations of S4's at 91° and 269°.
	Fall 2009 (RE25)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 272°, 299°, 30°, 329°, 61°, 88° and 270°.
		EVT-1	EVT-1 examinations of S1 and S2 and at 10° and 350°. EVT-1 examinations of two (2) additional welds near the 350° tee-box S2 welds.
	Spring 2011 (RE26)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications.
		EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4 @ 91° & 269°. No indications. EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4@ 91° & 269°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 on A sparger, S1 @ 10, S2 @ 8° & 12° and S4 @ 89° & 271°. No indications.

			EVT-1 on B sparger, S1 @ 350°, S2 @ 348° & 352°, XTRW welds near T-box @ 346° & 354°, and S4 @ 89° & 271°. No indications.
		VT-1	VT-1 on the B sparger, S3a & S3b @ 271°-89° and S3c @ 279°. No indications.
			VT-1 of the sparger brackets at 30.5°, 61°, 88°, 270°, 272°, 299°, and 329.5°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4@ 91° & 269°. No indications observed.
			EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4's@ 91° & 269°. No indications observed.
		VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets (SB) at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications observed.
Top Guide (Rim, etc.)	1991-1995	VT	VT of top guide beams of fifty (50) cells was performed in 1991 per RICSIL 059. No indications. VT exams of the members in the load path between the top guide and core shroud in 1995 per SIL 588. One (1) indication on the 90° aligner pin keeper was observed and evaluated as acceptable (indication not on load bearing portion of assembly).
	Spring 1997 (RE17)	VT -1	VT-1 re-examination of Top Guide Aligner Pin located at 90° in accordance with SIL 588, R1. Indication on aligner pin keeper did not appear to change in size.
	Spring 2000 (RE19)	VT -1	VT-1 of two (2) hold down assemblies. No indications.
	Fall 2001 (RE20)	VT -1	VT-1 of two (2) horizontal aligner pins with no new indications. VT-1 of four (4) hold down assemblies.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld.
	Fall 2006 (RE23)	VT-1	VT-1 on two (2) hold down assemblies and aligner pin assemblies at 90° and 270°. A previous indication identified on the non-load bearing keeper of the aligner pin assembly at the 90° location was observed with no apparent change. However, two (2) new but similar type indications were also observed on the same keeper. Three (3) new indications were observed on the non-load bearing aligner pin keeper at the 270° location. Indications were evaluated as acceptable.
		VT-3	VT-3 examinations performed on accessible areas of top guide per B-N-2. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 0 and 180°. One (1) new indication identified on non-structural keeper at 180°. Similar to indications in keepers seen at 90° and 270°. Evaluated as acceptable.
		EVT-1	EVT-1 examinations of accessible areas of Rim weld.
		VT-3	VT-3 examinations performed of accessible top guide hold down assemblies, rim pins per B-N-2.
	Fall 2009 (RE25)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 90°. No change in the indication at the 90° aligner pin keeper.
		EVT-1	EVT-1 examinations of 10% or fourteen (14) of top guide grid beams per BWRVIP-183. No indications. However, only eight (8) were credited as quality examinations.
		VT-3	VT-3 examinations of accessible areas of top guide per B-N-2.

	Spring 2011 (RE26)	VT-3	VT-3 of accessible areas of Top Guide per B-N-2. No indications.
		VT-1	VT-1 for BWRVIP-26 credit was performed on the Hold Down assemblies and Aligner Pin assemblies at 270°. An indication not previously reported was observed adjacent to the attachment weld adjoining the Aligner Block to the Top Guide. Indication appears to be a manufacturing remnant that was not completely removed during construction. Previously identified indications were also observed with no changes. Scope was expanded to include the remaining other three (3) Aligner Pin assemblies located at 0°, 90°, and 180°. VT-3 for Sect. XI B-N-2 and VT-1 for BWRVIP-26 credit was performed. Aligner Pin assembly at 0° was found to have seven (7) previously unidentified indications, with four (4) identified in the Aligner Pin Keeper and three (3) identified in the Aligner Block. Review of previous inspection video showed faint presence of indications. Evaluated as acceptable. Aligner Pin assembly at 90° was found to have one (1) previously unidentified indication located on the Aligner Pin Keeper. Review of previous inspection video showed a faint presence of the indication. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable. Aligner Pin assembly at 180° was found to have two (2) previously unidentified indications located on the Aligner Pin Keeper. Review of previous inspection video shows presents of indications. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld. EVT-1 of two (2) top guide cell locations per BWRVIP-183. No indications.
	Fall 2012 (RE27)	VT-1	VT-1 examinations performed on hold down assembly at 180°. No indications.
		VT-1	VT-1 of the aligner pin assembly at 0° was performed to confirm seven (7) flaws identified in RE26. Four (4) of the flaws on the keeper were confirmed and verified to have no changes. One (1) flaw on the aligner pin block was confirmed and verified to have no changes. The two (2) other previously identified flaws on the block were determined to be non-relevant surface scratches. VT-1 of the aligner pin assembly at 90° was performed to confirm seven (7) flaws identified on the keeper in RE26. 4 of the flaws were confirmed and verified to have no changes. One (1) additional flaw on the keeper was also reported. This flaw is similar to flaws seen on the other aligner pin keepers, but could not be verified in previous video due to camera positioning. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) flaws identified in RE26. All of the flaws on the keeper were confirmed and verified to have no changes. VT-1 of the aligner pin assembly at 270° was performed to confirm four (4) flaws identified in RE26. Three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) previously reported flaw adjacent the aligner block to top guide weld was examined using an improved camera and delivery mechanism and determined to be a non-relevant surface scratch.
	Fall 2014 (RE28)	EVT-1	EVT-1 examinations of accessible areas of Rim weld. No indications

		VT-1	VT-1 examinations performed on accessible top portion of the TG hold down assembly at 0°. No indications. VT-1 of the aligner pin assembly at 0° was performed to confirm five (5) previously identified flaws. Four (4) flaws on the keeper were confirmed to have no changes. The identified flaw on the aligner pin block showed slight increase in length. VT-1 of the aligner pin assembly at 90° was performed to confirm five (5) previously identified flaws. The 5 flaws on the keeper were confirmed to have no changes. Five (5) unreported flaws on the aligner block were detected. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) previously identified flaws. The three flaws on the Keeper were confirmed to have no change. Five (5) unreported flaws on the aligner block and two (2) on the top guide were detected. VT-1 of the aligner pin assembly at 270° was performed to confirm three (3) previously identified flaws. The three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) unreported flaw on the aligner block and one (1) on the top guide were detected.
		EVT-1	EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No crack indications identified.
	Fall 2016 (RE29)	EVT-1	EVT-1of five (5) of top guide grid beams per BWRVIP-183. No indications. EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No indications identified.

		VT-1	VT-1 of accessible top portion of the TG hold down assembly at 90°. No indications.
		VT-1/ EVT-1	VT-1 and EVT-1 of aligner pin assembly at 0° confirmed five (5) previously identified flaws. All flaws showed no changes, except for Flaw 6 on the keeper which appeared longer compared to previous examination but difference was attributed to improved tooling and lighting.. VT-1 and EVT-1 of aligner pin assembly at 90° confirmed ten (10) previously identified flaws on the keeper and block. All flaws showed no changes except for, Flaw 5 (keeper) and 10 (block) which appeared longer compared to previous exam with difference attributed to improved tooling an lighting. VT-1 and EVT-1 of aligner pin assembly at 180° confirmed nine (9) previously identified flaws. All flaws showed no changes, except for Flaws 2 and 3 on keeper which appear longer compared to previous exam with difference attributed to improved tooling and lighting. One (1) new flaw was reported on the block to slider weld that was later confirmed to be present in the previous exam. Change attributed to improved tooling and lighting. VT-1 and EVT-1 of aligner pin assembly at 270° confirmed five (5) previously identified flaws that showed no changes. One (1) new flaw reported on keeper to washer weld that was later confirmed to be present in the previous exam.
Core Plate (Rim, etc.)	Fall 1995	VT-3	VT-3 examinations of Hold down bolts examined in 1995 per SIL 588. No indications.
	Spring 2000 (RE19)	VT -3*	VT-3 examinations of 48 bolts examined from top side. *(Bolts are not accessible for EVT-1)

	Fall 2001 to Fall 2009 (RE20 – RE26)	VT-3	VT-3 examinations performed on accessible areas per B-N-2. No indications.
	Fall 2012 (RE27)	VT-3	VT-3 examination of three (3) hold down bolt locations (70, 71, and 72) from the top side. No indications.
	Fall 2014 (RE28)	VT-3	VT-3 exam of 36 (50%) hold down bolt locations from the top side. No indications.
SLC	1986-2001	VT-2	VT-2 examinations of SLC penetration during Class 1 RPV pressure test each outage.
	Spring 2003 (RE23)	EVT-2	Enhanced VT-2 examinations during Class 1 pressure test. No indications.
	Spring 2005 (RE22)	EVT-2/UT	Enhanced VT-2 performed of safe-end and penetration in conjunction with ASME Section XI Class I pressure test. Manual UT to Appendix VIII performed on nozzle to safe-end weld. No indications.
	Fall 2006 (R23)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2008 (RE24)	EVT-2	Enhanced VT-2 examinations performed of safe-end and penetration in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2009 (RE25)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2011 (RE26)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.

	Fall 2012 (RE27)	UT	UT examination of N10 SLC nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2014 (RE28)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
Jet Pump Assembly	1986-1995	VT-1/VT-3 /UT	VT examinations on ten (10) Jet Pumps each outage. Exam includes applicable GE SILS. Jet pump beams replaced in 1985. Jet pump beam UT first performed in 1993.
	Spring 1997 (RE17)	VT-1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Examinations deferred to Fall 2001.
	Fall 2001 (RE20)	VT-3	VT-3 examinations on all 20 jet pump nozzle inlets per SIL 465. No indications.
		VT-1	VT-1 examinations on all WD-1's. No indications.
		EVT-1	EVT-1 examinations on BB-1 and BB-2 on JP's 1-10. EVT-1 on MX-2's on JP's 1 – 10. EVT-1 on RB-1's and RB-2's on JP's 1/2, 3/4, and 5/6. No indications. EVT-1 on RS-1's, RS-2's, and RS-3's on JP's 1 – 10. EVT-1 on RS-6's on JP's 1, 3, and 5. EVT-1 on RS-7's on JP's 2, 4, and 6. EVT-1 on RS-8's and RS-9's on JP's 1/2, 3/4, and 5/6. No indications.
	Spring 2003 (RE21)	VT-3	VT-3 examinations on the JP nozzle inlet mixers on JP's 11 - 20 per SIL 465. VT-3 examinations of set screws, gaps, and tack

			welds on JP's 1 – 20 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on the IN-4 on JP's 5, 6, 11, 12, 13, and 14. EVT-1 examinations on the MX-2 on JP's 11, 12, 13, and 14. EVT-1 examinations on the RB-1's and RB-2's, on JP's 11/12 and 13/14. EVT-1 examinations on RS-1 and RS-2 on JP's 11/12, 13/14, 15/16, and 17/18; RS-6 on JP's 11 and 13; RS-7's on JP's 12 and 14; RS-8's and RS-9's on JP's 11/12, 13/14. No indications.
		UT	UT examinations on the BB-1's and BB-2's for JP's 1 – 20. No indications.
	Spring 2005 (RE22	VT-3	VT-3 on the JP nozzle inlet mixers on JP s 1 – 10 per SIL 465. No indications.
		VT-1	VT-1 examinations on JP set screws, gaps and tack welds on JP's 1, 2, 15, and 16 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on RS-1, RS-2, and RS-3 welds on JP's 1 and 2 and the IN-4 welds on JP's 7, 8, 9, and 10. No indications.
	Fall 2006 (RE23)	VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 9, 10. VT-1 of WD-1 at JP's 9, 10. No indications.
		EVT-1	EVT-1 of RS-1 and RS-2 on JP's 15/16 and 19/20.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of IN-4's at JP's 19 and 20. EVT-1 examinations of RB-1a's, -1b's, -1c's, and -1d's between JP's 9/10 and 19/20. EVT-1 examinations of RB-2a's, -2b's, -2c's, and -2d's between JP's 9/10 and 19/20. EVT-1 examination of RS-3 between JP's 19/20. EVT-1 examinations of RS-6 at JP's 9 and 19. EVT-1 examination of RS-7 at JP's 10 and 20. EVT-1 examinations of RS-8 and RS-9 at JP's 19/20 and 9/10. No indications.

		UT	UT of BB-1, -2 and -3 on all 20 JP beams. No indications. UT of MX-2 (and AD-1, AD-2, DF-1, DF-2, DF-3 note in Diffuser Section) on all 20 jet pumps.
	Fall 2009 (RE25)	VT-3	VT-3 of JP nozzle inlets per SIL465 on JP's 15, 16, 17 and 18. No indications.
		VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 10. 15, 16, 19, and 20. VT-1 of WD-1 at JP's 17, and 18. No indications.
		EVT-1	EVT-1 examinations of IN-4 on JP's 15, 16, 17, and 18. EVT-1examinations of RB-1's and RB-2's on JP's 7/8, 15/16, and 17/18. EVT-1 examinations on RS-1's and RS-2's on JP's 11/12 and 17/18. EVT-1examinations on RS-3's on JP's 11/12, 15/16, and 17/18. EVT-1 examinations on RS-6's on JP's 7, 15, and 17 and RS-7's on JP's 8, 16, and 18. EVT-1 examinations on RS-8's and RS-9's on JP's 7/8, 15/16, and 17/18. No indications.
	Spring 2011 (RE26)	VT-3	VT-3 of JP nozzle inlets on JP 9 and 10. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed.
		EVT-1	EVT-1 of RS-8 and RS-9 on JP-1 thru JP-14, JP-19, and JP-20. No indications. EVT-1 of JP-9 and JP-10's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-3, RS-1, RS-2. EVT-1 of JP-9's RS-6 and JP-10's RS-7. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of JP-13 and JP-14's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, & RS-3.

			EVT-1 of RS-6 on JP-13 and RS-7 on JP-14. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications. EVT-1 of JP-15 and 16's RS-3. No Indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1, 2, 9, 10, 13, 14, 15, 16, 19, & 20. No indications of movement or wear observed. VT-1 of the JP-15 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of 0.003" with no signs of movement. Vessel side set screw confirmed to have partial contact. No indications on slip joint. VT-1 of the JP-20 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of .004" with no signs of movement. Newly reported Vessel side set screw gap measured to be .013". No indications on slip joint.
		VT-3	VT-3 of JP nozzle inlets on JP-13 and 14. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of MX-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 of JP-1 and JP-2's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6 on JP-1 and RS-7 on JP-2. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed. VT-1 of the set screws and auxiliary wedges on Jet Pump 1, 2, 9, &10. JP10 had a previously identified shroud side gap that was found to be 0.011" with no

			signs of movement. JPs 1, 2, and 9 set screws and aux wedges were found to be in full contact with no signs of wear.
		VT-3	VT-3 of JP nozzle inlets on JP-1 and 2. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of MX-2 and IN-4 on JP-6. No Indications.
			EVT-1 of RS-1, RS-2, and RS-3 on JP-3&JP-4 and RS-1 and RS-2 on JP-7&JP-8. No Indications
			EVT-1 of JP-5&JP-6's RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, and RS-9. No Indications.
		VT-1	VT-1 of set screw gaps and slip joints on JP-15 and JP-20. No Indications.
			VT-1 of the JP Restrainer Wedge (WD-1) at JP-5 and JP-6. No indications.
		VT-3	VT-3 of JP nozzle inlets on JP-6. No indications.
Jet Pump Diffuser	1986-1998	VT -3	10 Jet Pumps VT-3 examined each outage. No indications. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT-1/VT-3	VT examinations on ten (10) jet pumps. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Exams deferred to Fall 2001.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on ten (10) jet pumps (5 assemblies). Identified an indication thought to be a broken jet pump sensing line upper bracket retaining weld. Evaluated as acceptable.

	Spring 2003 (RE21)	VT-3	VT-3 on JP sensing lines for all jet pumps per SIL 420. No indications.
		VT-1	VT-1 on sensing line brackets for all jet pumps per SIL 420. Previously reported cracked bracket weld was determined not to be cracked. No indications.
		EVT-1	EVT-1 examinations of AD-1, AD-2, AD-3a, AD-3b welds on JP's 11 through 20. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 on JP sensing lines for JP's 1 – 11 and 14 per SIL 420. No indications.
		VT-1	VT-1 on JP sensing line brackets for JP's 1- 11 and 14. No indications.
	Fall 2006 (RE23)	EVT-1	EVT- 1 on AD-1 on JP's 1, 2, and 5. EVT-1 examinations on AD-2, AD-3a, AD-3b, DF-1 on JP-15, 16, 17, 18, 19, and 20 and DF-2 on JP's 15, 16, 19, and 20. No indications.
	Spring 2008 (RE24)	UT	UT on AD-1, AD-2, DF-1, DF-2, and DF-3 (and MX-2). One (1) indication on DF-1 at JP-14.
		EVT-1	EVT-1 examinations on DF-1 at JP-14 in addition to UT. Appeared to be a defect from original construction.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of indication to DF-1 on JP-14 identified during the previous outage. No change.
	Spring 2011 (RE26)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication was found to have no changes.
	Fall 2012 (RE27)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication did not change.
	Fall 2014 (RE28)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-1, DF-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 re-examination of indication located on the inside surface of

			JP-14 at the DF-1 weld. Indication did not change.
	Fall 2016 (RE29)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-2 on Jet Pumps 3, 4, 5, 6, & 7. No indications. EVT-1 of DF-1 (outside diameter) on Jet Pumps 6 and 14. No Indications. EVT-1 of DF-1 (inside diameter) for re-examination of indication on the inside surface of JP-14. Indication showed no change.
CRD Guide Tube	Fall 1995	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 1997 (RE17)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Fall 1998 (RE18)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of eighteen (18) anti-rotation pins and eleven (11) CRGT-1 welds. No indications.
		EVT-1	EVT-1 examinations of four (4) CRGT-2 and CRGT-3 welds. No indications.
	Fall 2001 (RE20)	VT-3	VT-3 examinations of thirteen (13) anti-rotation pins and thirteen (13) CRGT-1 welds. No indications.
		EVT -1	EVT-1 examinations of five (5) CRGT-2 and CRGT-3 welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations on one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations of one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of two (2) CRGT-2 welds and three (3) CRGT-3welds. No indications.
		EVT-1	

	Fall 2009 (RE25)		EVT-1 examinations on one (1) CRGT-2 weld and two (2) CRGT-3welds. No indications.
CRD Stub Tube	N/A	N/A	No record of examination.
In-core Housing	NA	NA	No record of examination back to 1996
Dry Tube	1989-1991	VT	VT exam in 1989, 1990, and 1991 per SIL409R1. All dry tubes replaced in 1993.
	Spring 2005 (RE22)	VT	Replaced one (1) dry tube.
	Fall 2012 (RE27)	VT-1	VT-1 was performed on dry tube locations at 12-09 and 28-25. No indications.
	Fall 2014 (RE28)	VT-1	VT-1 performed on IRM dry tube locations at 20-25 and 36-41. No indication observed. Replaced IRM dry tube at 12-41.
	Fall 2016 (RE29)	VT-1	VT-1 on Dry Tube Locations. IRM 28-33 & 36-09 and SRM 12-33, 20-17, & 36-25. No Indications.
Instrument Penetrations	1986-2000	VT-2	VT-2 examination performed during RPV system leakage test each outage for all six (6) instrument nozzle penetrations. No indications.
	Spring 2000 (RE19)	PT	PT examination of N16A instrument penetration nozzle to safe-end weld.
	Fall 2001 (RE20)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2003 (RE21)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2005 (RE22)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
		UT	UT examination of N16 nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
	Fall 2006 (RE23)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.

	Spring 2008 (RE24)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2009 (RE25)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2011 (RE26)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2012 (RE27)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2014 (RE28)	UT	UT examination of N16B nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2016 (RE29)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
Vessel ID Brackets	1986-1995	VT -1/VT-3	ASME XI VT-3 (non-beltline) and VT-1 (beltline examinations) of jet pump riser brace, dryer, FW Sparger, Core Spray, guide rod, and surveillance capsule holder brackets performed once per interval. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
		EVT-1	EVT-1 examinations on four (4) CS bracket attachment welds. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of guide rod attachment welds. No indications.
		VT-1	VT-1 on FW sparger brackets. No indications.

		EVT-1	EVT-1 examinations on CS bracket attachment welds. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on all FW sparger bracket attachment welds and all dryer support attachment welds. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examination of on JP riser brace pad attachment weld at 150°. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 examination of steam dryer hold down brackets.
	Fall 2006 (RE23)	EVT-1	EVT-1 of eight (8) FW sparger brackets and four (4) CS piping bracket attachment welds. No indications.
	Spring 2008 (RE24)	VT-3	VT-3 of guide rod attachment welds. No indications.
		EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 30°, 150°, 210°, 270°, and 330°. EVT-1 examinations of steam dryer support bracket attachment welds at 215° and 325°. No indications.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 60°, 90°, and 120°. No indications.
	Spring 2011 (RE26)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 30°. No Indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of four (4) CS piping bracket attachment welds at 30°, 150°, 210°, and 330°. No indications. EVT-1/VT-1 of JP riser brace pad attachment welds at 270°. No indications. EVT-1/VT-3 of steam dryer support bracket attachment welds at 215° and 325°. No indications.

		VT-1	VT-1 of surveillance capsule holder brackets at 300°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of Riser Brace attachment welds on JP-1 & 2 at 150°. No indications.
		EVT-1/ VT-3	EVT-1/VT-3 of steam dryer support bracket attachment welds at 145° and 35°. No indications.
		VT-1	VT-1 of surveillance capsule holder brackets at 30° & 120°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 90°. No Indications.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	Fall 2001 (RE20)	VT-1	VT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2003 (RE21)	EVT-1	EVT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2005 (RE22)	VT-1	VT-1 of leveling screws per OE 16110
	Fall 2006 (RE23)	VT-1 w/Character Card	Performed baseline VT-1 examinations to BWRVIP-139 and SIL 644, Rev 2. Re-examined five (5) minor indications previously identified per SIL 474 adjacent to several drain channels. Two (2) new indications were observed in a weld adjacent to a drain channel and both tack welds on one (1) lifting lug were observed. The indications were evaluated as acceptable.
	Fall 2009 (RE25)	VT-1 (89)	VT-1 examinations on seven (7) previously identified indications on dryer. With additional cleaning, six (6) of the

			indications disappeared with only one (1) remaining (i.e., the cracked tack welds on one (1) lifting lug - no change in the lifting lug).
	Fall 2016 (RE29)	VT-1 (89)	Performed VT-1 examinations to BWRVIP-139-A. Re-examined one (1) previous indication of cracked tack welds on lifting lug @ 145° with no changes. The other three (3) lifting lugs were observed to have similar cracked tacks that were not previously reported. Five (5) Tie Rods were reported to be slightly bent with no broken welds. One (1) additional indication was observed on the lower guide bracket weld at 180° that extended into the skirt. The indication was arrested with a 5/8th inch Stop-drill hole. No other dryer indications reported.
Dissimilar metal welds	Spring 2008 (RE24)	UT	Automated UT performed on four (4) CAT A welds per Appendix VIII. Manual UT performed on two (2) CAT A welds. All welds included in Risk-Informed ISI Program. No indications.
	Spring 2011 (RE26)	UT	Manual UT inspection performed on one (1) CAT D nozzle to cap weld (CRD Return) per Appendix VIII and Risk-Informed ISI Program. No indications.
	Fall 2014 (RE28)	UT	Manual UT inspection performed on three (3). CAT A welds per Appendix VIII. All welds included in Risk-Informed ISI Program. No indications.
	Fall 2016 (RE29)	UT	Automated Phased Array UT performed on one (1) CAT D weld and manual UT performed on one (1) CAT A weld. Both welds included in Risk-Informed ISI Program. No indications.

Reactor Internals Inspection History

Plant: **Dresden 3**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Spray Piping	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of piping and welds in annulus. Indications observed at two lower elbow to pipe welds 2P4c and 4P4c. These welds were repaired using GE designed clamps.
	4/97-R14	UT/EVT-1	UT Baseline inspections per BWRVIP-18 of all piping circ welds in annulus. Repairs removed and not reinstalled. EVT-1 of any piping welds in annulus inaccessible to scanner. Additional flaws identified on 1, 2 and 3P8a welds.
	2/99-R15	EVT-1	EVT-1 examined undemonstrated welds P8a and P4d on all four downcomers. Installed a "bumper" repair on 1P8a at the 80° downcomer.
	9/00-R16	UT/EVT-1	UT of "Target" welds and EVT-1 of all undemonstrated welds. Also EVT-1 of welds made inaccessible from repair installed on the 80° downcomer including 1P7, 1P4c, 1P4d, 1P8a and b. Welds 2P4c and 4P4c exhibited flaw growth as predicted by Flaw Evaluation.
	10/02-R17	VT-1	Six P4 welds for presence of "excessive grinding". NRI. All undemonstrated welds P8a and P4d and long seams on thermal collars, NRI
	10/04 – R18	EVT-1	Examined piping welds 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b. Eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		NA	Performed Core Spray Lower Sectional Replacement (all four downcomers) eliminating welds 1-4P4c, 1-4P4d, 1-4P8a, 1-4P8b, 1-4P5, 1-4P6, and 1-4P7.
	11/06 – R19	VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of all accessible bolting, keepers, ratchets and latch springs. NRI - VT-3 of all repair hardware. NRI

		EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
	11/08 – R20	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 4P4a, 4P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI
	11/10 – R21	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI.
		VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of 4 bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/12 – R22	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 1P4a, 1P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. One RI due to partially cracked tack weld.
	11/14 – R23	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for two piping brackets. RIs on both brackets due to partially cracked tack welds.
		VT-1/VT-3	Core Spray Lower Sectional Replacements (all four lines) - VT-1 of bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/16 – R24	EVT-1	Examined piping welds: 1P1, 2P1, 2P2, 2P3, 3P3, 4P4a, 4P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for three piping brackets. RIs on two brackets due to partially cracked tack welds.

Core Spray Sparger	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of spargers and tee-boxes. NRI.
	4/97-R14	EVT-1, VT-3	Examined tee-box cover plate welds (S1), tee-box to sparger arms (S2), and sparger end caps (S4) to EVT-1. NRI. Examined sparger nozzles (S3) and the sparger piping to VT-3. NRI.
	10/00 - R16	EVT-1, VT-3	Per BWRVIP-18: EVT-1 of all S1, S2 and S4. VT-1 of 50% of S3. NRI.
	10/04 – R18	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			-All 12 sparger brackets and bracket to shroud welds. NRI. -Core Spray Lower Sectional Replacement (all four downcomers) eliminating inspection of the following welds: 1-4S1, 1-4S2a-b.
	11/08 – R20	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 1S3 (007-080°), 1S3 (080-183°), 2S3 (007-110°), 2S3 (110-183°). NRI.
			All 12 sparger brackets and bracket to shroud welds. One relevant indication identified. Indication acceptable for one cycle of operation.
	11/10 – R21	VT-1	One sparger bracket to shroud weld which had a previous indication identified in R20. No identified change. Indication acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			All 12 sparger brackets and bracket to shroud welds. No change observed on previously identified relevant indication.
	11/14 – R23	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.

	11/16 – R24	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.
Attachment Welds	4/94-R13	VT-1	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. NRI.
	10/00-R16	VT-1	ASME Section XI B-N-2, surveillance capsule holder attachments in beltline. All six sets examined. NRI.
	10/02 - R17	EVT-1	BWRVIP-48 attachments: four dryer lugs, eight feedwater sparger end-brackets, eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI
	10/04 – R18	EVT-1	Four steam dryer wall support lugs, lug to pad, and pad to vessel attachment welds. Eight feedwater sparger lug to vessel attachment welds. NRI.
		VT-1	Eight feedwater sparger end-bracket lug assemblies. NRI
	11/06 – R19	VT-3	Examined attachment welds for two Core Spray piping brackets and all four steam dryer wall support lugs in accordance with ASME Section XI. NRI
		EVT-1	Inspected piping bracket to piping weld and bracket to vessel attachment weld on 2 core spray piping brackets. NRI
	11/08 – R20	EVT-1 and VT-3	- Examined attachment welds for two Core Spray piping brackets. NRI - Examined surveillance capsule holder bracket attachment welds. NRI
		VT-3	Examined steam dryer and steam separator guide rod attachment welds. NRI
	11/10 – R21	EVT-1	Examined attachment welds for two Core Spray piping brackets and two steam dryer wall support lugs. NRI
	11/12 – R22	EVT-1	Examined attachment welds for all 8 feedwater sparger end bracket attachment welds. NRI
	11/14 – R23	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI
	11/16 – R24	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI

Core Shroud	4/94-R13	EVT-1 and UT	Inspections per SIL 572, extensive indications in circumferential welds.
	4/97-R14	EVT-1 and UT	Inspected all shroud repair design reliant structure prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspections consisted of EVT-1 of all ring segment welds (accessible surfaces), UT for minimum ligament of all vertical welds accessible to scanner and EVT-1 for minimum ligament on all accessible surfaces of all vertical welds not accessible to the scanner.
		NA	Installed four tie-rod shroud repair assemblies and four core plate wedges.
	2/99-R15	VT-1	Examined all four tie-rod assemblies and core plate wedges at locations specified by the manufacturer (GE).
	10/00-R16	UT	Examined a 40° segment of H4 to assist in shroud qualification of Core Spray Repair. NRI.
	10/04 – R18	EVT-1	Examined Ring Segment Welds V1-V4 (Shroud Head RSWs), V8-V13 (Top Guide RSWs), and V20-V25 (Core Plate Support RSWs). Historical indications at V23 and V25 revealed no apparent change since last inspection in R14 (indications are not in HAZ. All other RSWs NRI.
	11/06 – R19	UT	GE utilized the Telescoping Shroud Scanner to perform UT on Shroud vertical welds V5-V6, V14-V19, V26-V28. Coverage obtained as follows: V5 – 80.4% V6 – 34.8% V14 – 66.8% V15 – 75.6% V16 – 80.4% V17 – 77.9% V18 – 95.5% V19 – 69.8% V26 – 13.7% V27 – 69.4% V28 – 57.6% One indication identified on V27 (1.8" in length). Indication acceptable for continued operation in accordance with BWRVIP-76.

		EVT-1	Performed one-sided EVT-1 examinations on vertical welds. NRI. Coverage as follows: V7 – 40% V29 – 40% (between H7 and H8 welds) V30 – 0% (between H7 and H8 welds) V31 – 30% (between H7 and H8 welds) V32 – 0% (between H7 and H8 welds)
		VT-3, EVT-1	Performed GE recommended inspections of shroud repair hardware. Scope included inspections to address susceptible areas based on indications found at Hatch. One RI identified due to retainer clip not engage. This retainer clip is redundant and did not require repair.
	11/08 – R20	EVT-1	Examined historical indications at V23 and V25. No apparent change from previous inspection.
	11/10 – R21	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V1, V2, V3, V4, V8, V9, V10, V11, V12, V13, V20, V21, V22, and V24. Horizontal indications were identified in the top guide ring below H2, near V12 and V13. Indications acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V7, V29, V30, V31 and V32. Inspected previous indications V12, V13, V23 and V25. Indications evaluated as acceptable.
		EVT-1&VT-1	Inspected shroud repair hardware and core plate wedges at all four azimuths. RI-minor wear noted.
	11/14 – R23	EVT-1	- Inspected previous indications V12 and V13 with no change observed. - Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
	11/16 – R24	UT	Inspected shroud vertical welds V5-V6, V14-V19, V26-V28. One indication identified on V27 (1.8" in length). Indication acceptable in accordance with BWRVIP-76.
		EVT-1	- Inspected vertical ring welds V1-V4, V8-V13 and V20-V25. Indications noted on V12, V13, V21, V22, V23 and V25. Indications evaluated as acceptable. - Inspected shroud vertical weld V7. NRI

		VT-3	- Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
Shroud Support	4/94-R13	UT/VT-1	Access hole cover VT/UT for circ and radial flaws. NRI.
	4/97-R14	EVT-1	Examined H8 and H9 for about 12" at 4 locations of shroud repair hardware attachment areas. NRI.
	2/99-R15	EVT-1	Per BWRVIP-38: Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI. Requirements for this inspection cycle are satisfied. NRI.
	10/02- R17	EVT-1	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	10/04 – R18	EVT-1	Examined H8 and H9 between Jet Pumps 10 and 11 (132°-177°). NRI
	11/06 – R19	EVT-1, VT-3	VT-3 of accessible areas of H9 and EVT-1 of 10% of H9 (between Jet Pumps 10 and 11). NRI.
	11/08 – R20	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI.
	11/10 – R21	UT	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	11/12 – R22	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°) and Jet Pumps 10 and 11 (132°-177°). NRI.
SLC	10/02 - R17	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/06 – R19	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/10 – R21	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/14 – R23	UT	UT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
Jet Pump Assembly	4/94-R13	VT-1	Hold down beams, beam bolt keepers, lockplates 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. Prior to R13, visually inspect 100% of upper areas of each Jet Pump including beam retainers every other outage.

	4/94-R13	VT-1	Riser brace arm to yoke welds on three upper (secondary) riser braces found cracked. Repairs are not required. No other reportable indications.
			Diffuser to baffle plate welds on all twenty jet pumps. NRI.
	4/97-R14	EVT-1	All ten RS-1, 2, 3, 4 and RS-5. NRI.
	2/99-R15	EVT-1	Initiate BWRVIP-41: Medium Priority: 50% of DF-1, MX-1, MX-3 and IN-5 welds. All twenty RB-1, 2, RS-8 and RS-9. NRI. High Priority: 50% of DF-2, AD-1, 2 and 3. NRI.
		VT-1	Examined all twenty WD-1 locations. NRI.
	10/02-R17	EVT-1	Repeat examination of four DF-2 welds to improve coverage. NRI.
			Five RS-9 and 10 riser to secondary brace yoke welds, NRI. Eleven secondary brace RB-3 welds per ASME XI and BWRVIP-48. NRI.
	03/03-D3M09	VT-1	Verified acceptable restrainer set-screw gaps when replaced beams (reference Jet Pump Beams section of this report). Aux wedges installed two set-screw locations. The other locations were NRI.
	10/04 – R18	VT-1	Examined jet pump sensing line clamps on jet pumps 1, 2, 3, 10, 11, 12, 13, & 20.
		EVT-1	Examined all twenty WD-1 locations. Noted normal movement of wedges 11 & 20 with no abnormal wear. All other wedges NRI.
			Examined AS-1 (set-screw gaps) on five jet pumps: 8 (Vessel Side, Shroud Side), 9 (VS, SS), 11 (SS), 12 (VS, SS), 20 (VS, SS). No unacceptable gaps were identified (all less than 0.010").

			Examined AS-2 (set-screw tack welds) on five jet pumps: 8 (VS, SS), 9 (VS,SS), 11 (SS), 12 (VS, SS), 20 (VS,SS). Lack of fusion of tack welds was identified on jet pumps and set screws: 9 (VS), 11 (SS), & 13 (VS). Indications noted on the tack welds for 9 and 13 were accepted as-is for one-cycle. Jet pump 11 had a set screw missing from its housing. The set-screw was retrieved and an auxiliary wedge was installed. Also discovered during the inspection of jet pump 11 was a poor quality tack weld on the swing-gate keeper. The condition of the bolt keeper was accepted for one cycle.
			The auxiliary wedge installed during D3M09 on jet pump 13 was examined and historical cracking was re-identified on the set-screw mounting block. This indication is historical and was caused by the ejection of the inlet-mixer following the failure of a beam-bolt. The indication has been accepted as-is. Also discovered on jet pump 13 was a gap between the vessel side restrainer bracket and the swing gate. The condition of the bracket and swing gate was accepted for one cycle.
			Examined RS-10 & -11 on jet pumps: 2, 3, 4, 12, & 13. NRI. Examined RS-1, 2, & 3 on five jet pump pairs: 1/2, 3/4, 9/10, 11/12, 13/14. NRI.
		UT	Examined MX-3a&b, DF-1, -2 & -3 and AD-1, -2 on jet pumps: 2, 3, 4, 5, 8, 9, 12, 13, 18, & 19. NRI.
	11/06 – R19	EVT-1	Examined RB-1 & 2 on jet pumps: 1, 2, 3, 4, & 20. NRI Examined RS-4 & 5 on jet pump pairs: 9/10, 11/12, 13/14. NRI Examined RS-8 & 9 on jet pump pairs: 1/2, 3/4, 5/6. NRI Examined MX-1 and IN-5 on jet pumps: 1, 2, 3, 4, 5, 11, 12, 13, 14, and 15. NRI
		VT-1	Examined aux wedge on JP 11. RI for slight wear on JP 11 aux wedge. Justified continued operation for one cycle. Examined main wedge WD-1 on JPs 1, 2, 3, 4, and 11 for wedge wear. NRI.

		NA	- Installed new ratchet style swing gate on JP 11 to address degraded keeper tack weld identified in R18. - Staked threads due to cracked tack welds (found in D3R18) and installed aux wedges on JP 9 vessel side and JP 13 vessel side set screws.
	11/08 – R20	EVT-1	Examined RB-3 on JPs 1, 2, 3, 4 and 5. NRI
		VT-1	- Examined aux wedges on JPs 9, 11 and 13. RI for slight wear on JPs 9 and 11 aux wedges. Justified continued operation for one cycle. - Examined AS-1 on JP 9 SS and JP 11 VS. NRI - Examined main wedge WD-1 on JPs 1, 2, 7, 8, 9, 11, 12, 13, 14, 17, 18, 19 and 20 for wedge wear. One RI for a bent main wedge handle. Condition acceptable as-is. - Examined swing gate keeper tack welds on JPs 7, 8, 9, 10 and 20. NRI - Examined JPs 1 and 2 transition pieces and sensing lines to address operating trends. NRI - Examined JP 11 swing gate bolting and ratchets. Swing gate installed in D3R19. NRI
	11/10 – R21	EVT-1	- Examined AD-1, AD-2, AD-3a, AD-3b on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI - Examined MX-3a and DF-1 on jet pumps 1, 10, 11, 14 and 15. NRI. - Examined MX-3b and DF-2 on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI. - Examined RS-1, RS-2, and RS-3 on jet pumps risers 5-6, 7-8, 15-16, 17-18 and 19-20. NRI. - Examined RS-8, -9, -10, and -11 on all of the jet pumps. NRI. - Examined RB-1 on jet pumps 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19. NRI.

		VT-1	- Replaced an aux wedge on JP 11. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined (secondary) riser brace arm to yoke welds on jet pump 19. RI with the condition acceptable as-is. - Examined swing gate latches and welded keepers on jet pumps 4, 5, 6, 15 and 16. NRI - Examined sensing line clamps on jet pumps 1 and 20. NRI - Examined main wedge WD-1 on JPs: 3, 4, 5, 6, 10, 15 and 16 for wedge wear. NRI
	11/12 – R22	EVT-1	- Examined RB-2 welds on jet pumps 9-12 & 19. NRI - Examined RS-4 & RS-5 on JP risers 1/2, 17/18 & 19/20. NRI - Examined RS-2 on JP risers 1/2, 3/4, 9/10, 11/12 & 13/14. NRI - Examined MX-1 welds on JPs 6-10. NRI - Examined RB-3 welds on 5 JPs. NRI - Examined JP-11 BB-2. NRI
		VT-1	- Examined RB-3 welds on all 20 JPs. NRI - Examined WD-1 on JPs 1, 2, 8, 11, 12 & 14. NRI - Examined swing gate keeper tack welds on JPs 1, 12, 13, 14 & 19. NRI - Examined Aux wedges on JPs 9 & 11. RI - Some wear was observed. - Examined vessel side AS-1 on JP 11. NRI
		VT-3	- Examined IN-5 bolting on JPs 6-10. NRI - Examined slip joint on JP 11. NRI
	11/14 – R23	VT-1	- Examined WD-1 on all jet pumps. RIs for wear on jet pump 9 and bent bail handles on jet pumps 17 and 20. - Examined swing gate keeper tack welds on four jet pumps and swing gate ratchets on one jet pump. NRI - Examined Aux wedges on JPs 9 & 11. RI - Wear was observed with both auxiliary wedges. - Examined vessel side AS-1 on JP 11 and shroud side AS-1 on JP 9. NRI

		VT-3	- Examined sensing line clamps on six jet pumps. RI on JP 12 due to gap between clamp and sensing line standoff bracket. - Examined jet pump 9 slip joint. NRI
	11/16 – R24	EVT-1	- Examined MX-3a and DF-1 on jet pumps 6, 7, 16, 17 and 20. NRI. - Examined MX-3b on jet pumps 9, 12, 13, 18 and 19. NRI. - Examined AD-1, AD-2, AD-3a and DF-2 on jet pumps 2, 3, 4, 5, 8, 9, 12, 13, 18 and 19. NRI. - Examined RS-1 and RS-3 on jet pumps risers 1-2, 3-4, 9-10, 11-12 and 13-14. NRI. - Examined RS-8 and -9 on jet pumps 11-12, 13-14 and 15-16. NRI. - Examined RS-10 and -11 on jet pumps 1-2, 11-12 and 15-16. NRI. - Examined RB-1 on jet pumps 1, 2, 3, 4 and 20. NRI. - Examined AS-1 on JP 9 shroud side and JP 11 vessel side set screws. NRI.
		VT-1	- Replaced aux wedge on JP 11 and installed slip joint clamps on jet pumps 11 and 12. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined aux wedge on JP 13. Minor wear noted. - Examined main wedge WD-1 on JPs: 4, 5, 7, 10, 11 and 19 for wedge wear. NRI - Examined main wedge WD-1 on JP 9. No change to previous wear.
		VT-3	- Examined sensing line clamp on JP 12. No change to previous indication.
Jet Pump Beams	4/94-R13	UT	Jet pump beams are UT examined each outage using technique capable of detecting cracking at throat and ears. Original group 1 beams.
	4/97-R14	UT	Examined all beams. Two beams with indications replaced. Balance NRI
	2/99-R15	UT	Examined all beams. NRI
	10/00-R16	UT	Two beams with indications replaced with group 2 style beams. Balance NRI.
	03/03-D3M09	NA	Replaced all 17 original beams with weld-less keeper Group 2 beams.

	10/04 – R18	VT-3	Examined 17 group 2 beam bolt retainer mechanisms (weld-less keeper) to ensure all keepers were engaged. NRI.
		EVT-1	Examined 3 group 2 welded keeper style beams. BB-1 and BB-2 on Jet Pumps 5, 8, and 13. NRI.
	11/06 – R19	NA	Pre-emptive replacement of aging beams on JPs 5, 8 and 13 rather than UT examine.
	11/08 – R20	VT-1	- Examined beam ratchet engagement on JPs 5, 8 and 13 after 1 cycle of operation. NRI - Examined beam and ratchet engagement on JPs 1 and 2 to address operating trends. NRI
	11/12 – R22	UT	Examined BB-1, BB-2 and BB-3 on 18 of 20 jet pump beams (Group 2). NRI
	11/14 – R23	UT	Examined BB-1, BB-2 and BB-3 on jet pump 11 beam (Group 2). NRI
		VT-1	Examined all 20 jet pump beam retainer clips. NRI
LPCI Couplings	NA		
Lower Plenum	4/97-R14	MVT-1	CRD Stub Tube, CRD H7. NRI.
	4/97-R14	MVT-1	ICH/RPV-1 and ICHGT/ICH-1, two inspected from cell H7. NRI.
	10/00-R16	EVT-1	Per BWRVIP-47: examined CRGT-1, 2 and 3 on D10. NRI.
	10/02-R17	EVT-1 and VT-3	Examined 9 CRGT-1, 2 and 3 and FS/GT-ARPIN. NRI. This completes first 5% in 6 years.
	10/04 – R18	VT-3	Bottom Head Drain cleaning project created access for the following examinations: - Examined eight Stub Tube to Vessel Welds (ST/RPV-1) and eight Stub Tube to CRD Housing Welds (CRDH/ST-1) in cells: F7, G6, G7, G8, H7, H8, H9, and J8. NRI. - Inspected two locations for Core Plate to Stiffener Plate Stitch welds: G7 & G8 beam welds. NRI. - Examined two locations for Stiffener Plate to Stiffener Rods welds: G7 and H8 beam tie rods. NRI.
	11/08 – R20	VT-3	Examined 9 CRGT-1 and FS/GT-ARPIN. NRI. This completes 10%.

		EVT-1	Examined 9 CRGT-2 and 3. NRI. This completes 10%.
	11/10 – R21	VT -3	Installation of a plug in the bottom head drain to support drain line valve maintenance created access for the following examinations from cells G7 and H8: - Examined accessible portions of eight Stub Tube to Vessel (ST/RPV-1) welds, eight Stub Tube to CRD Housing (CRDH/ST-1) welds and eight CRD Housing to Cap (CRDH-1) welds. NRI. - Examined accessible portions of four In-Core Monitor Housing to Vessel (ICH/RPV-1) welds, four In-Core Monitor Housing to In-Core Housing Guide Tube (ICHGT/ICH-1) welds, two In-Core Housing Support Hardware to In-Core Housing Guide Tube (ICHS/ICGT-1) tack welds and four In-Core Housing Support (ICHS-1) hardware tack welds. NRI.
Feedwater Spargers (Not in BWRVIP Scope)	11/06 – R19	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on four brackets. Justified operation for one cycle. Inspected sparger repair hardware from D2R18 isokinetic probe retrieval. NRI
	11/08 – R20	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on five brackets. Justified operation for one cycle.
	11/10 – R21	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. No apparent change in wear from R20.
	11/12 – R22	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R21. Performed inspections of spargers, arm welds and t-box welds. RI - Dent on one nozzle.
	11/14 – R23	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R22.

Steam Dryer	10/04 – R18	"Best Effort" VT-1	- Examined exterior surfaces including outer hoods, historical repair areas, tie bars and attachment welds, four lifting assemblies, four hold down assemblies, two man way covers, cover plates, fourteen gussets, upper ring welds, vertical guide welds, outlet plenum lower horizontal welds, outlet plenum vertical welds, and perforated plates. Multiple indications identified, including structural fatigue flaws in the outer hood areas. Outer hoods modified to repair cracking. - Examined interior surfaces including: drain channel welds, supports, vertical and horizontal plates, support ring, horizontal cross beams, and horizontal cross beam gussets. Initial start-up steam sample probe discovered missing. Probe located and retrieved from steam separator. Multiple non-structural indications also noted.
		VT-3	Examined interior and exterior skirt. Indications noted.
	11/06 – R19	"Best Effort" VT-1	Performed VT-1 inspection of outer hood welds on old dryer where previous indications had been identified and repaired. NRI.
		NA	Installed new dryer.
	11/08 – R20	"Best Effort" VT-1	Examined critical components on steam dryer after one cycle of operation per GE recommendations. One RI where dryer contacted steam separator guide rod (RI on guide rod also). Dryer and guide rod indications acceptable for one cycle of operation.
	11/10 – R21	"Best Effort" VT-1 and VT-3	Examined critical components on steam dryer. The RI from R20 where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change on both the SS guide rod and the SD.
	11/12 – R22	"Best Effort" VT-1 and VT-3	- Examined critical components on steam dryer. The previous RI where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change. - Examined dryer support lugs. Minor indications noted due to contact with the dryer.

	11/14 – R23	VT-1	- Examined the previous RI where the dryer contacted the steam separator guide rod with no change noted on dryer and guide rod. - Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
	11/16 – R24	VT-1	- Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
Top Guide	4/94-R13	VT-1	Examined beam intersections in five cells in response to industry experience. NRI.
	4/97-R14	VT-1	Per BWRVIP-26, baseline examined all four top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at the four aligner assembly locations. NRI.
	10/00-R16	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined rim weld 11. NRI.
	10/04 – R18	VT-1	Examined 90° and 180° top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at 90° and 180°. NRI.
	11/06 – R19	EVT-1	Examined rim weld from cell 03-34. NRI
	11/08 – R20	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined top guide rim weld. NRI
	11/12 – R22	EVT-1	- Top guide rim weld was inspected at accessible locations. NRI - Top guide grid beams were inspected from 10% of the cells (18 cells). NRI.
		VT-1	The aligner pins and sockets at all four locations. Indications identified at all four aligner blocks. Indications evaluated as acceptable for one cycle.
	11/14 – R23	VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. No change to previously identified indications.
	11/16 – R24	EVT-1	Top guide rim weld was inspected at accessible locations. NRI
		VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. New growth was observed on one of the previously identified indications.

Vessel	10/02 – R17	UT	Examined vertical welds SC1A, SC1C, SC2B, SC3A, SC3B, SC3C, SC3D, SC4A, SC4B, SC4C, and SC4D. NRI.
	10/04 – R18	UT	- Examined vertical welds SC1B, SC2A, SC2C, SC3A, and SC3B. NRI. Satisfies third interval Section XI inspection requirements. - Examined two original vessel construction base metal repair areas in beltline as required by Section XI. NRI.
		VT-3	Inspected cladding in accordance with ASME Section XI. NRI.
	11/06 – R19	VT-3	Inspected the reactor vessel cladding from the shroud flange to the reactor flange in accordance with ASME Section XI. NRI
	11/12 – R22	UT	Examined all 14 vertical welds, the flange to shell circumferential weld and two original vessel construction base metal repair areas in beltline as required by Section XI. All identified indications acceptable per Table IWB-3510-1.
		EVT-1	Examined weld and heat affected zones on four level instrument nozzles. NRI
Nuclear Instrument Dry-tubes (Not in BWRVIP Scope)	4/94 - R13	VT-1	Identified one cracked dry tube (24-37). Replaced. Examined every other outage to date. Per Reutter-Stokes recommendations, have not reached manufacturer's service life.
	11/06 – R19	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/08 – R20	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/10 – R21	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. RI identified movement on one IRM between the plunger and the Top Guide. Rub marks were also noted on the plunger. Acceptable as-is.
	11/12 – R22	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/14 – R23	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI
	11/16 – R24	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI

Steam Separator (Not in BWRVIP Scope)	10/04 – R18	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear that was evaluated as-is for continued operation. Examined eight standpipe to shroud head welds and eight gusset to ring welds, NRI.
	11/10 – R21	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation. Replaced two SHBs. One of the two was missing the pin and the other had excessive pin to window wear.
	11/12 – R22	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/14 – R23	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/16 – R24	VT-1	Examined pin and window condition on 2 shroud head bolts. No change to previous wear.
Piping Welds (BWRVIP-75-A)	11/08 – R20	UT	Performed manual UT on four (4) IGSCC Category C welds and two (2) IGSCC Category A welds. None of these welds were dissimilar metal (DM) welds. No relevant indications identified.
	11/10 – R21	UT	Performed manual UT on six (6) IGSCC Category D welds. Five of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/12 – R22	UT	Performed manual UT on seven (7) IGSCC Category D welds. Four of these welds were on the reactor head spray system and three were on the reactor head vent system. Four of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/14 – R23	UT	Performed manual UT on nine (9) IGSCC Category C welds. None of these welds were dissimilar metal (DM) welds. No relevant indications were identified.

	11/16 – R24	UT	Performed UT exams on six IGSCC Category D welds. Two were on the HPCI system and four on the ISCO system. All six of these welds were DM welds. Five of the welds had automated exams performed. No relevant indications were identified.
Cast Austenitic Stainless Steel	11/12 – R22	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/14 – R23	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/16 – R24	EVT-1	Inspected one fuel support piece and one control rod guide tube base. NRI

Reactor Internals Inspection History

Plant: **Duane Arnold Energy Center**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1995	UT	Performed ultrasonic examination of the accessible areas. Baseline per BWRVIP-01, no indication were detected.
	2001	UT	Performed ultrasonic examination of the H1-H7 welds, no indications found.
	2010	Phased Array UT	Unable to complete the ultrasonic examination of the accessible areas due to equipment issues. Performed OD EVT-1 inspections to supplement and submitted Deviation Disposition to do the UT exams in 2012. No indications found.
	2012	Phased Array UT	Indication on H1 weld, approx. 1" long and 1/8" deep, ID. All other welds no indications.
Access Hole Covers	2012	Phased Array UT	Performed ultrasonic examination of 0° and 180° AHC. Two indications found on each AHC up to 70% through wall and 30% around. Evaluated in accordance with BWRVIP-180.
Shroud Support	1988/1993	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	1998	VT-3	VT-3 of shroud support.
	1999	VT-3	Shroud Support including H-8/H-9 (360 degrees).
	2001	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	2003	VT-3	Shroud Support including H-8/H-9 (180 to 360 degrees).

	2005	VT-3	Shroud Support including H-8/H-9 (0 to 180 degrees).
	2007	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of 180° of the shroud plate including both access hole covers – no indications.
	2009	VT-3	Shroud Support including the H-8/H-9 (0 to 180 degrees) – no indications.
	2012	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of H8/H9 – no indications.
Core Spray Piping	96 (portion every RFO)	VT	Performed Visual Examination (EVT, CSVT, VT-3), baseline per BWRVIP-18, no indications were detected.
	1998	EVT-1	Reinspection per BWRVIP-18 – no indications.
	1999	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2001	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2003	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2005	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2007	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2009	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2010	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2012	EVT-1	Reinspection per BWRVIP-18 – no indications.

	2014	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2016	EVT-1	Reinspection per BWRVIP-18 – no indications
Core Spray Sparger	96 (portion every RFO)	VT	Performed Visual Examination (CSVT, VT-3), baseline per BWRVIP-18, no indications were detected. One sparger nozzle is inspected every other RFO due to a missing tack weld.
	1999	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2001	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2005	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2009	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2012	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2014	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
Top Guide (Rim, etc.)	1995	VT-1 (1/2 mil wire)	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. 100% inspection of the grid locations has been completed over the past three RFOs.
	1998	VT-3	VT-3 0° location.
	1999	VT-3	Examined nine cells (top general and bottom of grid areas).
	2001	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect the two hold down assemblies.

	2003	VT-3	Examined five cells (top general and bottom of grid areas).
	2005	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect two hold down assemblies.
	2005	VT-3	Examined four cells (top general and bottom of grid areas).
	2007	VT-1	Performed VT-1 examination of the bottom side of eight grid locations – no indications.
	2009	VT-1 VT-3	Performed VT-1 of the Latches at 46° and 226° location. VT-1 of the fillet welds on the contour wedges at 90° and 270°. Was not able to obtain 100% coverage of the fillet welds on the contour wedges due to the fuel being in the way. Will re-schedule in 2010. Performed VT-3 of the top guide – no indications.
	2010	VT-1 VT-3	Performed VT-1 of the Latches at 136° and 316° location. VT-1 of the fillet welds on all contour wedges. Performed VT-3 of the top guide – no relevant indications.
		EVT-1	Performed EVT-1 at Grid Locations 42-27, 42-23, 22-43, 22-03, 02-23, and 02-19 – no relevant indications.
	2014	VT-1	Performed VT-1 of the Latches at 226° location – no relevant indications. Performed VT-1 of the contour wedges and fillet welds at 90° and 270°. Was not able to obtain 100% coverage of the contour wedges and fillet welds due to the fuel bundle being in the way. Will re-schedule exams for 2016.
	2016	VT-1	Performed VT-1 of the contour wedges and fillet welds at 90° and 270° and verified that alignment blocks in place. Previous indications identified in 2010 have not changed. An additional shallow indication was found on a contour wedge

			and on an alignment block. Will schedule exams for 2018.
Core Plate (Rim, etc.)	1995	VT-3	Verified 25% core plate bolts were in place.
	1998	VT-3	Verified 20% core plate bolts.
	1999	VT-3	Examined Fuel support castings in nine cells, no indications.
	2001	VT-3	Verified rim hold down bolts 1-54 Examined Fuel support castings in ten cells, no indications.
	2003	VT-3	Examined Fuel support castings in five cells, no indications.
	2005	VT-3	Examined Fuel support castings in twenty cells, no indications.
	2007	VT-3	Performed a general VT-3 of Fuel Support Casting in eight locations – no indications.
	2009	VT-3	Performed a VT-3 examination of Fuel Support Castings in 12 locations – no indications.
	2012	VT-3	Performed VT-3 on 12 of 54 core plate bolts – no indications
	2014	VT-3	Performed VT-3 on 14 of 54 core plate bolts – no indications.
SLC	1993	PT	Liquid Penetrant examination of the nozzle-safeend weld.
	2001	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2003	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2005	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld.

	2007	UT	Performed Appendix VIII UT of the Nozzle-Safeend Weld – no indications.
	2016	UT	Performed Appendix VIII Automated Phased Array UT of the Nozzle-Safeend Weld – no indications.
Jet Pump Assembly	96 (sample every RFO)	VT-3	Inspection of the riser spt pads (SIL551), holddown beams (SIL330), sensing lines (SIL420), three point contact (RICSIL078). Will inspect Riser Elbow in 1998. Repair to the set screws have been completed.
	1998	MVT-1	50% of total number of jet pumps, 100% of each inspected – no indications. All hold down beams – no indications.
	1999	UT EVT-1	DF-1 on JPs 1, 2, 3, 4, 13, 14, 15, 16, IN-4, MX-2 and WD-1 on JPs 3, 4, 13, and 14, RB-1 and RB-2 on JPs 3, 4, 13 and 14. This completes all exams on 8 of 16 JPs.
	2001	EVT-1	RB-1, RB-2, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, on JPs 7 and 8. No indications.
	2003	EVT-1	RB-1, RB-2, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, and 10. RS-1, RS-2, RS-3, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, 10, 11, 12. DF-1 on JPs 5, 6, 7, 8, 9, and 10. No indications. All hold down beams - no indications.
	2007	UT	Performed UT of all 16 Jet Pump. Holddown beams using GE technique – no indications.

	2007	EVT-1	AD-1 on JPs 15,16 AD-2 on JPs 15, 16 DF-1 on JPs 11, 12, 15, 16 DF-2 on JPs 15, 16 IN-4 on JPs 11, 12, 15, 16 MX-2 on JPs 11, 12, 15, 16 RB-1 on JPs 1, 2, 11, 12, 15, 16 RB-2 on JPs 1, 2, 11, 12, 15, 16 Riser Brace Pad on JPs 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16 RS-1, RS-2, RS-3 @ 324° location RS-6 on JPs 11, 15 RS-7 on JPs 12, 16 RS-8, RS-9 @ 252°, 324° locations
		VT-1	WD-1 on all 16 JPs No indications noted from any of the visual examinations.
	2009	EVT-1	DF-2 on JPs 1, 2, 3, 4, 13, 14 AD-1 on JPs 1, 2, 3, 4, 13, 14 AD-2 on JPs 1, 2, 3, 4, 13, 14 RS-1, RS-2, RS-3, TS-1A @ 36°, 72°, 288°
		VT-3	Sensing Line Clamp on JPs 1, 2, 3, 14 Sensing Line Support on JPs 4, 5, 12, 13 Sensing Line Exits at 90° and 270° No indications noted from any of the visual examinations.
	2010	EVT-1	RB-1, RB-2 on JPs 5, 6, 7, 8 RS-6, RS-7 on JPs 5, 6, 7, 8 RS-8, RS-9 on all JPs IN-4, MX-2 on JPs 5, 6, 7, 8 DF-1, DF-2 on JPs 5, 6, 7, 8 AD-1, AD-2 on JPs 5, 6, 7, 8 RS-1, RS-2, RS-3, TS-1A @ 108°, 144°
		VT-3	Sensing Line Clamp on JPs 6, 7, 8 Sensing Line Support on JPs 6, 7, 8 No relevant indications, indications on sensing line clamps were determined to be the result of initial installation.
	2012	EVT-1	DF-1, DF-2 on JPs 13, 14, 15, 16 AD-1, AD-2 on JPs 13, 14, 15, 16 RS-1, RS-2, RS-3, TS-1A @ 288°, 324°

	2014	EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 3 (at 64°), and 4 (at 80°) - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JPs 9 (208°) and 10 (224°) – no relevant indications.
	2016	UT	Performed UT of all 16 Jet Pump. Holddown beams using WesDyne technique – no indications.
		EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 11 and 12 - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JP 11 and standoff on JP 12– no relevant indications.
CRD Guide Tube & Stub Tube	95 (every 10 years)	VT-3	Inspected accessible portions of three guide tubes and three stub tubes, no indication were detected.
	2003	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2005	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2007	VT-3	Performed general VT-3 examination of eight locations – no indications.
Dry Tube	88 (6 cycles and then every three cycles)	VT-1 (1 mil wire)	Inspected in 1988 with indications reported, replaced with the new design.
	1999	VT-3	Inspected accessible portions of 11 dry tubes, no indications noted.

	2007	VT-1	Performed VT-1 of upper 24" of five dry tubes. Note the exam was performed on the accessible areas – no indications.
	2009	VT-1 VT-3	Performed examination on four dry tubes. Note the exam was performed on the accessible areas – no indications.
	2010	VT-1	Performed examination on six dry tubes. Note the exam was performed on the accessible areas – no indications.
	2014	VT-1	Performed VT-1 on five (5) dry tubes. Note the exam was performed on the accessible areas – no indications.
	2016	VT-1	Performed VT-1 on two (2) dry tubes. Note the exam was performed on the accessible areas – no indications.
Instrument Penetration			
Vessel ID Brackets	Every 10 years	VT1(active fuel) VT-3 all others	Per ASME Section XI.
LPCI Coupling	N/A	N/A	Not applicable to DAEC.
Top Head	1998	VT-3	No indications.
	1999	VT-3	No indications.
	2003	VT-3	No indications.
	2005	VT-3	No indications.
	2007	VT-3	Performed VT-3 of interior portion of the RPV Head – no indications.
Guide Rod	1998	VT-3	No indications.
	1999	VT-3	Both examined (found cracked tack weld on 0 degree rod which was evaluated as acceptable).
	2001	VT-3	Inspected 0 degree guide rod, no additional indications.

	2003	VT-3	Inspected 180 degree guide rod, no indications.
	2007	VT-3	Inspected 180 degree guide rod, bracket, and bracket welds – no indications.
	2009	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
	2016	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
Sample Holder Integral Attachments	1998	VT-1 VT-3	No indications.
	1999	VT-1 VT-3	108 and 288 degree examined with no indications.
	2001	VT-1 VT-3	108 degree examined with no indications.
	2003	VT-1 VT-3	36 and 108 degree examined with no indications.
	2005	VT-1 VT-3	288 degree examined with no indications.
	2007	VT-3	108° location – no indications.
	2009	VT-3	288° location – no indications.
	2012	VT-3	All upper brackets – no indications.
	2014	VT-1	All lower brackets – no indications.
Core Spray Piping & Sparger Brackets	1998	VT-3	No indications.
	2001	VT-3	No indications.
	2005	VT-3	No indications.
	2009	EVT-1	Performed EVT-1 on the Piping Brackets at 30°, 150°, 210°, and 330° - no indications.

		VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2012	VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2014	VT-1	Performed VT-1 on the Sparger Bracket at 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2016	EVT-1 & VT-3	Performed EVT-1 on the Piping Bracket attachment welds and VT-3 of the attachment hardware at 30°, 150°, 210°, and 330° locations – no indications.
Jet Pump Riser Support Pad	1998	VT-1	No indications.
	2003	VT-1	216 degree pad – no indications.
	2005	VT-1	144 and 252 degree pads – no indications.
	2014	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 3 (at 64°), and 4 (at 80°) – no indications.
	2016	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 11 and 12 – no indications.
Feedwater Spargers	1998	VT-1 VT-3	Indications around flow holes.
	2001	VT-1 VT-3	No additional indications.
	2005	VT-1 VT-3	No additional indications.
	2007	VT-1	Detailed inspection of all four spargers at the following locations due to broken keeper: Vessel Attachment Keeper to pin Handle interface Keeper to Sparger Bracket weld Pin to sparger bracket Pin to wall bracket

			Sparger Bracket & Bolts Sparger Bracket to Vessel Measurement Sparger to End Plate Jacking Bolts (two spargers only) T-Box to Sparger Welds Wear was noted in several locations. (details can be provided if requested).
	2009	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications
		EVT-1/ VT-3	Performed EVT-1/VT-3 of Bracket Welds at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no indications Implemented a FW Sparger Modification to repair the indications noted in 2007. This modification was to re-install the preload on the spargers @ 225° and 315°.
		VT-1	Performed VT-1 on FW Brackets @ 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - wear was identified on the 264° 276°, and 354°.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2012	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.
		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2016	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.

		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
Steam Dryer	2003	VT-1/3	Inspect per GE SIL644. Indications in Upper Support Ring, Drain Channels, and Access Openings- all indications evaluated "use as is".
	2005	VT-1/3	Inspect per GE SIL644 Rev 1. Indications in Drain Channels and Upper Support Ring – all indications evaluated "use-as-is". No change in previous indications.
	2007	VT-1	Inspected per BWRVIP-139 (all exterior locations) Indications in Drain Channels, Access Openings and Upper Support Ring. All indications evaluated "use-as-is" for one cycle. Some of the previous indications could not be located and some new indication were identified. (Details can be provided if requested.)
	2009	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). All previously identified indications were noted as "No change". Three new indications were identified. 1) Upper Guide Bracket was observed to have a rolled piece of metal extending out and below the face/corner of the guide channel. 2) Middle weld on Tie Bar #4 was found cracked, and 3) Lower guide bracket, 180° side was found bent. All indications were determined to be acceptable.
	2010	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). Two previously identified indications were noted as NRI, all others were "No change". Three new indications were identified on access hole

			cover. All indications were determined to be acceptable. Repairs made to Tie bars 3, 4, and 7 and to the rolled metal on the upper guide found during previous outage.
	2012	N/A	No inspections
	2014	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
	2016	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
Dissimilar Metal Weld	2009	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on four (4) Category C, seven (7) Category D and two (2) Category E dissimilar metal welds.
	2010	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on ten (10) Category C, fifteen (15) Category D and two (2) Category E dissimilar metal welds. One category C weld had relevant indications. This was repaired by a weld overlay during the outage.
	2012	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on one (1) Category C dissimilar metal weld – no indications.
	2014	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on three (3) Category C and four (4) Category D dissimilar metal welds – no indications.

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.
	Fall 2016 RF20	UT	Examined 100% accessible regions of H-3, 4, 5, 7. Found 5 indications in H4, all less than 3 inches length, less than 17% thru wall, 1.93% of examined length. Found 1 indication in upper side H5, 5.96 inches in length, depth 15%, 1.39% of examined length. Examined portions of H4 and H7 for off-axis indications in accordance with VIP interim guidance. 2 minor indications identified on H4, both less than 2 inches in length, depth less than 15% thru wall. Re-inspection scheduled for 10 years in accordance with BWRVIP-76 and VIP interim guidance.
Shroud Support	Spring 1994 RF06	VT-3	Examined 6 shroud support pillars 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 RF16	VT-3	Examined annulus surface. No issues or FME found.
	Spring 2012 RF17	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	Examined annulus surface, FOSAR, recovered 5 Powerfect nuts.
		EVT-1	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.
	Spring 2015 RF19	EVT-1	Examined flat access hole cover. No indications.
		EVT-1	Examined top hat access hole cover. Examined 77.78% circumferentially of vertical weld, 24.2% has signs of indications.
	Fall 2016 RF20	VT-3	Examined annulus surface. No issues or FME found.
		VT-3	Examined annulus surface. No issues found. Identified FME removed from the vessel.
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	Examined all creviced and non-creviced weld locations, no indications

		VT-1	Examined all (8) header brackets, no new indications.
	Spring 1999 RF08	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no new indications.
	Spring 2000 RF09	EVT-1	Examined all creviced weld locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Fall 2001 RF10	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Spring 2003 RF11	EVT-1	Examined all creviced weld locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2004 RF12	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2006 RF13	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2007 RF14	UT & EVT-1	Examined all creviced and 100% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2009 RF15	EVT-1	Examined all locations that could not be UT examined in the previous outage, no indications.
		EVT-1 & VT-3	Examined 25% header brackets. No indications.
	Fall 2010 RF16	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.

	Spring 2012 RF17	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.
	Spring 2015 RF19	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
	Fall 2016 RF20	EVT-1 EVT-1 & VT-3	Examined 'B' loop piping elbows (P4a-d), 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 RF16	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 RF16	EVT-1	Examined 4 top guide grid beam locations. No indications.
	Spring 2012 RF17	EVT-1	Examined 2 top guide grid beam locations. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 top guide grid beam locations. No indications. SRM plunger tip was not fully seated but was reseated into the receptacle.
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	50% riser braces (RB-1/2 & RS-8/9), 100% RS-1, no indications

		VT-1	100% sensing lines. Three pumps have cracked standoffs, installed clamps.
		VT-3	100% beams, no indications
		VT-3	100% wedges and setscrews. 1 screw with 1 tack cracked
	Spring 1999 RF08	EVT-1	50% riser brace(RB-1/2 & RS-8/9), no indications
		EVT-1	100% RS-1, no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% beams, 100% wedges and setscrews, no indications
	Spring 2000 RF09	EVT-1	50% riser brace (RB-1/2 & RS-8/9), no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% wedges and setscrews, no indications
	Fall 2001 RF10	VT-1	100% sensing lines, no indications
		VT-3	100% wedges
	Spring 2003 RF11	VT-1	100% wedges, no movement noted
		EVT-1	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
		VT-1	50% sensing lines, no indications
	Fall 2004 RF12	UT	100% beams, BB1/2, no indications
		VT-1	50% sensing lines, no indications
		EVT-1	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	50% sensing lines, no indications
		VT-1	100% wedges, one had minor wedge wear, installed slip joint clamp
		EVT-1	25% RB-1/2, 25% RS-8/9, no indications
	Fall 2007 RF14	VT-1	100% wedges, one had minor wedge wear and SS setscrew gap of 35 mil, installed auxiliary wedge
		VT-1	1 slip joint clamp, no issues
		VT-1	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 VT-3	100% wedges, no wear found. Slip joint clamp and aux wedge. No issues found.
		VT-1 VT-3	11 sensing lines. No indications. Installed aux wedge for an issue found previous outage.
		EVT-1	50% RS3, no indications.
	Fall 2010 RF16	EVT-1	100% RS-8/9 and 25% RS-6/7. No indications
		VT-1 VT-3	50% wedges. No new wear found. 3 sensing line clamps and 1 aux wedge. No issue found.
	Spring 2012 R17	EVT-1& VT-1	25% inlet/mixer and diffuser welds (IN4, MX2, DF1/2, AD1/2). No issues found. 3 riser brace welds. No issues found.
		VT-1 EVT-1	50% wedges. No new wear found. 3 RS-1 and RS-2. No issues found.
	Fall 2013 RF18	UT VT-1 VT-1	100% beams, no indications 3 sensing line lower bracket, no indications 6 known setscrews tack cracks. 3 confirmed no growth, 3 no indication.
	Spring 2015 RF19	VT-1	50% wedges and rods. No new wear found.
		VT-1	14 sensing line support brackets. No indications.
		VT-3	3 sensing line clamps. No indications.
		VT-3	1 Slip joint clamp. No indications.
		VT-3	2 Aux wedges. No indications.
		EVT-1	50% RS-3 Riser to Transition. No indications.
		EVT-1 & VT-1	2 Riser Braces, RB-1 & RB-2. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 restrainer bracket to riser pipe welds, RS-6 and RS-7, and 3 riser brace to riser pipe welds, RS-8 and RS-9, no indications.

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 VT-3	Below Core Plate Inspection Examined 100% of CRGT-2 & CRGT-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	VT-1	Examined IAW SIL 409. No indications found.
	Spring 1999 RF08	EVT-1	All 12 dry tubes had circumferential cracking approx 1 inch below the upper collar
	Spring 2000 RF09		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	VT-1	50% jet pump riser bracket, no indications
	Fall 1997 RF07	VT-1 VT-3	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

	Spring 1999 RF08	VT-1	25% core spray header bracket, 100% feedwater sparger bracket, 100% steam dryer support bracket, no indications.
		EVT-1	50% jet pump riser bracket, no indications
		VT-3	100% guide rod bracket, no indications
	Spring 2000 RF09	VT-1	25% core spray header bracket, no indications
		EVT-1	50% jet pump riser bracket, no indications
	Fall 2001 RF10	VT-1	25% core spray header bracket, no indications
		VT-3	100% guide rods, no indications
	Spring 2003 RF11	EVT-1	25% core spray header bracket, no indications
	Fall 2004 RF12	EVT-1	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 EVT-1 & VT-1	25% core spray header brackets. 100% feedwater brackets. Found minor pin wear on 2 pins. Evaluation justified operation for one cycle.
	Fall 2010 RF16	EVT-1 VT-1	25% core spray header brackets. 2 Feedwater bracket pins where wear previously found. No discernable change.
	Spring 2012 RF17	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 VT-1 VT-3	25% core spray header brackets and 4 jet pump riser braces. No issues found. Examined 120deg surveillance capsule assembly.
	Spring 2015 RF19	EVT-1 & VT-1	2 jet pump riser brace arm. No indications.
		EVT-1 & VT-3	25% core spray header brackets.
		EVT-1 & VT-3	100% steam dryer support bracket to RPV. No indications.
		VT-3	2 guide rod flange & brackets. No indications.
		VT-3	100% feedwater sparger vessel attachments. No indications.
		VT-3	2 Feedwater bracket pins where wear previously found. No additional wear.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
LPCI Coupling	Fall 2001 RF10	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2003 RF11	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2006 RF13	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2012 RF17	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2015 RF19	EVT-1 VT-1 VT-3	Examined 50% couplings. Two indications on the shroud attachment ring, ~.88" & 1".

		EVT-1	Expanded scope to include same location on balance of couplings. No indications.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
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	100% drain channels, one indication identified on skirt below a seismic lug access plate weld, 0.75"
		VT-1	100% support ring, no new indications, no growth on previous indication
	Spring 2003 RF11	VT-1	100% support ring, no new indications, no growth on previous indication
		EVT-1	Re-look at skirt indication, no growth
		EVT-1	Manway cover plate
		VT-1	100% cover plates
		VT-3	100% tie bars
		VT-1	100% lifting lug braces, one found severed.
	Fall 2004 RF12	VT-1	100% support ring, no growth on previous indication, new indication identified; 0.625" across top, and 0.75" down face.
		VT-1	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	Previously identified indications on support ring, no growth found.
		VT-1	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 crater crack found on a lifting rod bracket weld. All indications were evaluated for use as is. No repairs required.
	Fall 2010 RF16	VT-1	2nd re-baseline IAW BWRVIP-139 following EPU 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 RF17	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.
	Spring 2015 RF19	EVT-1 & VT-3	100% Support bracket to RPV. No indications.
		VT-1	Examined known flaw for growth. No growth observed.
	Fall 2016 RF20	VT-1	Examined 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 RF16	UT	Examined 5 category C welds after weld crown reduction; 2 by auto, 3 by manual. No indications found.
	Spring 2012 RF17	UT	Examined 1 category E weld by manual UT.
	Fall 2013 RF18	A-UT	Examined 3 category C welds with automated UT. No growth of known embedded flaws, no new indications.
	Fall 2016 RF20	A-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)
	Spring 2015 RF19	VT-3	Examined eight shroud head bolts, including pin area. No indications.
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.
Capsule	Spring 1994 Spring 2015 RF19		Removed 30 degree capsule. Removed 120 degree capsule per EPRI ISP program.

Reactor Internals Inspection History

Plant: **Oyster Creek Generating Station**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Steam Dryer	Fall 2016	Visual	VT-1 of all high stress (red) locations and 10% of green locations. A total of 81 locations were inspected. EVT-1 of all 4 Hold Down Assemblies and all 4 Dryer Lifting Rods. Re-inspected previous Steam Dryer indications and repair areas. Evaluated indication areas with no change and areas with minor change as acceptable as is. New indications on tie bars TB-F measured 1.3" and TB-I ~ ¼". Indications on drain channels welds V07 ID &V15 ID and Jacking Bolt at 50 degrees are new or showing growth or changes from the previous examinations. These indications are acceptable until 2020 which is after plant shutdown.
	Fall 2014	Visual	Re-inspected 2 Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2012	Visual	Re-inspected Steam Dryer indications and repair areas, including indications on the ID, identified during previous outages. Evaluated indication areas with no change and areas with minor change to use-as-is for one cycle.
	Fall 2010	Visual	Re-inspected Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2008	Visual	Completed BWRVIP-139 required inspections of the ID of the dryer using GEH Firefly ROV. Identified 2 areas of fatigue cracking in drain channels and 1 area of fatigue cracking in support beam to mid-support ring weld.

			Evaluated as use-as-is for one cycle in accordance with BWRVIP-139 generic flaw evaluation. Re-inspected Steam Dryer indications and repair areas identified during previous outages. Tie bar N-1 lower repair area was found degraded and GEH issued JCO for one cycle of operation.
	Fall 2006	Visual	Re-inspect Steam Dryer Indications identified during previous outages. EVT-1 cracks in hold-down area from 1R19. VT-1 all 4 lifting lugs and EVT-1 indications on 135 deg. lug. BWRVIP-139 required inspections (top side) completed. New fatigue indications were identified that required repair. Dryer repair project completed with 2 areas stop drilled and one crack in center baffle plate was cut out.
Core Shroud	Fall 2016	VT-3	VT-3 of Tie-Rods at 10 deg and 70 deg. No findings Re-inspection of two horizontal indications on vertical weld V-9. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. No changes in the end points from 2006. These conditions are acceptable for ten years.
	Fall 2014	VT-3	VT-3 of 5 Tie-Rods at 100, 130, 160, 280 and 350 deg. locations. No findings.
	Fall 2012	VT-3	VT-3 of 3 Tie-Rods at 170, 220 and 310 deg. Locations. No findings.

	Fall 2010	VT-3	VT-3 of 2 Tie-Rods at 10 and 70 deg. Locations (#2 and #8). No findings.
	Fall 2008	UT / EVT-1	UT / EVT-1 inspection completed for all 10 shroud vertical welds. One indication found with UT in V10 weld – 1.76 inches long with depth of 0.47 inches. A technical evaluation was completed to use-as-is.
		VT-3	VT-3 Tie-Rods at 100 deg, 130 deg, 160 deg, 280 deg, and 350 deg. No findings.
	Fall 2006	EVT-1	V-9 inspection of ID and OD. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. A technical evaluation was completed to use-as-is. VT-3 Tie-Rods at 170 deg, 220 deg and 310 deg. No findings. VT-1 of Upper Bracket to Shroud Ledge interface on all 10 Tie Rods. No findings.
	Fall 2004	None	No Examinations Required.
	Fall 2002	None	No Examinations Required.
	Fall 2000	EVT-1	V-3, V-4, V-15 and V-16. This was a one sided exam from the OD. No findings.
	Fall 1998	UT EVT-1	V-7, V-8, V-10 and V-12. V-11 I.D. Seven tie-rod assemblies baseline inspected. V-10 exhibited minor OD cracking away from the heat-affected zone. This cracking is believed to be associated with handling lugs that were welded during construction and removed after installation. All other inspected vertical welds were found free of indications. With the inspections

			performed in 16R and 17R, all accessible vertical welds in the shroud core region are complete. The following vertical welds could not be located. V-3, V-4, V-15 and V-16.
	Fall 1996	Visual	Inspected per BWRVIP-07. Three of ten tie rods inspected, no change from installation. EVT-1, OD of V-9 and V-11, (120" total). V-9 exhibited 3 small axial cracks in HAZ on the OD totaling 1.75". The ID of V-9 was free of axial cracks. A number of small transverse cracks were found on the OD and ID of V-9. V-11 was free of any indications. Analysis showed structural margin maintained.
	Fall 1994	Ultrasonic and visual	Inspected per BWRVIP-01 and 03. Cracks were detected in the Shroud welds H2, H4, H6A, and H6B. Lack of fusion was detected in H3 weld and visual cracks on the ID surface. The Tie Rod modification was installed. Base line visual performed of the tie rods.
Shroud Support	Fall 2016	EVT-1	EVT-1 of (2) of the 36 Lug / Clevis pin assemblies - #02 and #08. No findings.
	Fall 2014	Visual	EVT-1 of 5 of the 36 Lug / Clevis pin assemblies - #11, #14, #17, #29 and #36. No findings.
	Fall 2012	UT, EVT-1, VT-3	EVT-1 of 11 of the 36 Lug / Clevis pin assemblies - #5, #6, #12, #13, #18, #22, #23, #25, #31, #32 and #35. No findings. UT of H-9 from the OD (Drywell). Inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found "no change" in the 4" long indication in the N1E nozzle area. No other findings. VT-3 of 360 deg. (100%) of top of H9 weld. No findings.

	Fall 2010	Visual	EVT-1 of 6 of the 36 Lug / Clevis pin assemblies - #1, #2, #7, #8, #20 and #21. No findings.
	Fall 2008	Visual	EVT-1 of 8 Lug / Clevis pin assemblies - #10, #11, #14, #15, #17, #29, #30, and #36. No findings.
	Fall 2006	Visual	EVT-1 of 7 Lug / Clevis pin assemblies - #1, #18, #19, #23, #24, #32 and #33.
	Fall 2004	None	No examinations required.
	Fall 2002	UT	30% UT of H-9 from the OD (Drywell). UT inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found one 4" long indication in the N1E nozzle area. This "service induced" indication is in the bottom side of the H9 weld and does not penetrate into the base metal of the RPV.
	Fall 2000	Visual	25% of H-9, cleaning performed and EVT-1 inspection completed. This completes 100% inspection of the H-9 weld. No findings.
	Fall 1998	Visual	25% of H-9, cleaning performed and enhanced VT-1, no findings
	Fall 1996	Visual	25% of H-9, (different area then the 1994 inspection), cleaning performed and enhanced VT-1, no findings.
	Fall 1994	Visual	25% of H-9 cleaning performed and enchanted VT-1, no findings.
Core Spray Piping	Fall 2016	Visual	EVT-1 of all 10 annulus piping fillet welds. No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD,

			P4gD, P4hD, P3aB, P3bB and P4dB. No findings.
	Fall 2014	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings.
	Fall 2012	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 16.5 deg. No findings. EVT-1 of 25% sample butt welds: P4dA, P4eA, P4fA, P4iA, P4bB, P4cB, P4eB, P4fB, P4gB, and P4hB. No findings.
	Fall 2010	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 285 deg. No findings. EVT-1 of 25% sample butt welds: P4aA, P4g/aA, P3aC, P3bC, P4dC, P4eC, P4fC, P4aB, P3aD, and P3bD. No findings.
	Fall 2008	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD, P4gD, P4hD, P3aB, P3bB, and P4dB. No findings.
	Fall 2006	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 103.5 deg. No findings.

			EVT-1 of 25% sample butt welds: P4bA, P4cA, P2A, P4g/aA, P4g/bA, P4hA, P4iC, P4g/aC, P4g/bC, P4hC, P4bB, P4eB, P4fB, P4gB and P4hB. No findings.
	Fall 2004	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L-3, L-3A, L-4, L-20A, L-13A, L-5, L-7, L-8, L-10, L-11, and L-12 • U-3, U-3A, U-4, U-15A, U-24A, U-7, U-8, U-9, U-10, U-11, U-12, U-16, and U-17 100% of annulus pipe brackets at 15°, 105°, 195° and 285°. No findings. EVT-1 of all creviced welds in the annulus piping = U3, U3A, U4, U15A + U24A; L3, L3A, L4, L13A + L20A.
	Fall 2002	Visual	EVT-1 of a 25% sample (11 welds) of the butt welds (non-creviced) not inspected in 17R or 18R: • U1,U15,U17,U18,U19,U20 • L1,L9,L13,L16,L20 Inspect 100% of annulus pipe brackets (15°, 105°, 195° and 285°) No Findings.
	Fall 2000	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L3, L3A, L4, L6, L13A, L14, L15 and L20A • U3, U3A, U4, U7, U8 and U15A 100% of annulus pipe brackets 15°, 105° 195° and 285°. No findings.

	Fall 1998	Visual	All creviced welds in the annulus piping; sample (25%) of the non-creviced welds in the annulus piping: • L2, L9, L10, L11, L12, L13, L17, L18, L19 and L20 • U2, U5, U6, U13, U14, U15, U21, U22, U23 and U24 Sample (25%) of pipe brackets 285°, 195°
	Fall 1996	Visual	Inspected per BWRVIP- 03. Cleaning of all accessible weld/HAZ surface and performed enhanced VT-1. No findings.
	Fall 1994	Visual and air test	Inspected VT-1, (1 mil wire). No change to pinhole weld defect detected in slip joint in 1992. Note: Pinhole weld defect detected in 1992 in System I. Analysis showed structural margin maintained
Core Spray Sparger	Fall 2016	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings except some rolled material noted on the CS SB 271 deg at the middle bracket sparger B contact point. This wear is not in a weld or HAZ of a weld. Inspected all ten sparger repair clamps. No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings.

	Fall 2014	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C & D. No findings. VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2012	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings. Inspected all 10 sparger repair clamps. No findings.
	Fall 2010	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C and D (CASS). No findings.

			VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2008	Visual	EVT-1 Sparger Pipe End Cap welds: S4A – 60 deg., S4A – 240 deg., S4B – 60 deg., S4B – 240 deg. No findings. EVT-1 "T" box welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-C. No findings. VT-1 of 50% of the sparger bracket welds – SB – 055, 065, 150, 208, 235, 271 and 330 deg. No findings.
	Fall 2006	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 60 deg., S4C - 240 deg., S4D - 60 deg., and S4D - 240 deg. No findings. EVT-1 "T" box welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-B. No findings. VT-1 of 50% of the sparger bracket welds – SB – 026, 091, 120, 179, 240, 300, and 359 deg. No findings.
	Fall 2004	Visual	Inspected all sparger repair clamps. No findings. Inspected end cap welds S4A-60, S4A-240, S4B-60, and S4B-240. No findings. Inspected sparger brackets SB-055, 065, 150, 208, 235, 271 and 330. No findings
	Fall 2002	Visual and Air Test	VT-1 all spargers, nozzles, end cap welds and repair clamps. No findings. No new leaks were identified during the Air Test.

	Fall 2000	Visual and Air Test	All sparger end cap welds were cleaned and EVT-1 inspected. No findings. VT-1 of spargers, repair clamps, and nozzles. No findings. No new leaks were identified during the Air Test.
	Fall 1998	Visual and Air Test	All sparger repair clamps, both spargers.
	Fall 1996	Visual and air test	Inspected per BWRVIP-03. Cleaned end cap welds and performed enhanced VT-1. No findings. Tee box welds are clamped and not accessible to clean or visual. Performed VT-1, (1 mil wire), of sparger piping and nozzles. No findings.
	Fall 1994	Visual and Air Test	Performed VT-1, (1 mil wire) of sparger piping and nozzles. No findings.
	1978 - 1980	Visual	(2) Cracks in sparger piping. Repair clamps installed. Note: Cracking found in sparger in 1978; repaired with clamps. Sparger has been inspected and air tested every outage since then; report submitted to NRC for approval for restart every outage.
Top Guide	Fall 2016	Visual	EVT-1 of previous top guide grid beams indications. The largest indication was measured from cell 43-44 at 3.875". Three indications that were measured in 2010 had longer lengths in the 2016 examination (slight growth less than an inch). The indications are acceptable as is for 4 years. VT-1 of two Hold Down Bolts (33 and 213 deg). No findings.
	Fall 2014	None	No inspection required this outage.
	Fall 2012	Visual	VT-1 of 2 hold-down bolts at 123 deg. and 303 deg. No findings.

	Fall 2010	Visual	EVT-1 Inspection and Measurement of 3 Cracks in Grid Beams (#4, VT-3 & VT-6). Some crack growth was observed. Flaw evaluation completed to support use as is. BWRVIP-183: Inspect 5% = 7 cells. No findings.
	Fall 2008	None	Not required for this outage by analysis.
	Fall 2006	Visual	EVT-1 of selected known flaws in grid beams: #4, VT-3 and VT-6. One area showed no growth, while the other two had grown between 0.25" and 0.75" from the 2002 outage to the 2006 outage. A flaw evaluation was performed to use-as-is.
	Fall 2004	Visual	VT-1 of top guide hold down bolts at 303 and 123 degrees. No findings. EVT-1 of VT-6 crack showed no measurable growth. Could not visually locate two other existing UT indications.
	Fall 2002	Visual	EVT-1 of two existing cracks measured in 18R outage (#3 and #5). No change to crack length identified.
	Fall 2000	Visual	Top guide hold down bolt assembly VT-3 at 33° and 213°. Top guide beam to rim fillet welds VT-1 at 33° and 213°. No findings. VT-1 of two existing cracks (#3 and #5) with cleaning. Both cracks measured on both sides. Crack #5 showed approx. 1" growth. Crack #3 showed no measurable growth.
	Fall 1998	None	Not required for this outage by analysis.
	Fall 1996	Ultrasonic 100% grid beams	12 indications emanating from notches detected at intersections of cross members. 5 of the 6 cracks on bottom

			side of member at mid-span detected. Removed sample from beam with crack to investigate root case.
	Fall 1994	Visual	[Under side of Top Guide] Three additional vertical cracks were detected at mid-span locations. Disposition use as is.
	Fall 1992	Visual	[Under side of Top Guide] Two additional vertical cracks were detected at mid-span location. Disposition use as is.
	Fall 1991	Visual	[Under side of Top Guide] A vertical crack was detected at mid-span location. Disposition use as is.
Core Plate	Fall 2016	None	No exams were required.
	Fall 2014	None	No exams were required.
	Fall 2012	None	No exams were required.
	Fall 2010	Visual	VT-1 inspected 3 In-core guide tube plugs 28-45, 44-13 and 44-21. No findings.
	Fall 2008	Visual	Visually inspected core plate wedges at 96° and 276° azimuths. No findings.
	Fall 2006	None	No exams were required.
	Fall 2004	Visual	No wedge inspections required. Inspected in-core guide tube plugs 04-29, 20-37, and 12-21. No findings.
	Fall 2002	Visual	No inspections needed. Wedges replace hold down bolt inspections.
	Fall 2000	Visual	Visually inspected all 8 wedges to verify integrity after first cycle of operation. All wedges found as installed.
	Fall 1998	Visual	Wedges installed. No further exams of core plate were performed.

	Fall 1996	Visual	Inspected top portion only of 18 hold down bolt that were not inspected in fall 1994 and top periphery section at bolt locations. No findings.
	Fall 1994	Visual	Inspected 18 hold down bolt tops only and top periphery at bolt locations inspected. No findings.
Jet Pump Assembly	N/A	N/A	N/A
Jet Pump Diffuser	N/A	N/A	N/A
SLC	Fall 2016	UT	UT examined the N12 liquid poison nozzle DM weld. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	PT	PT of Liquid Poison Nozzle to Safe End Weld. No findings.
	Fall 2010	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2008	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2006	UT	PDI - UT the Liquid Poison Nozzle N12 / SE. No findings.
	Fall 2004	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2002	Visual / PT	PT of Liquid Poison Nozzle – No Indications. Inspect insulated nozzle from drywell during RPV pressure test. No leakage observed.
	Fall 2000	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 1998	VT-2 during Code pressure test.	Not made accessible for direct exam.
	Fall 1996	None	Not made accessible.

	Fall 1994	None	Not made accessible.
CRD Guide Tube	Fall 2016	None	Not required and not made accessible.
	Fall 2014	None	Not required and not made accessible.
	Fall 2012	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 1 guide tube base for CASS (VT-1). No findings
	Fall 2010	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 2 guide tube bases for CASS (VT-1). No findings.
	Fall 2008	None	Not required and not made accessible.
	Fall 2006	EVT-1, VT-3	Inspected 4 guide tubes. No findings.
	Fall 2004	EVT-1, VT-3	Inspected 4 guide tubes. No Findings.
	Fall 2002	EVT-1, VT-3	Inspect 1 guide tube (46-43) removed to support stub tube inspection. No findings.
	Fall 2000	VT-1, VT-3	2 guide tubes. No findings.
	Fall 1998	VT-3	15, no findings.
	Fall 1996	No inspection Performed.	Not made accessible.
	Fall 1994	No Inspection Performed	Not made accessible.
CRD Stub Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.
	Fall 2010	None	No inspections required.
	Fall 2008	None	No inspections required.
	Fall 2006	None	No inspections required.
	Fall 2004	None	No inspections required.

	Fall 2002	VT-1	Visual Inspection of 2 stub tubes found leaking at bottom head in Fall 2000 (42-43 and 46-39). No indications noted.
	Fall 2000	VT-1 VT-2 pressure test	None made accessible. 2 stub tubes found leaking at bottom head (42-43 and 46-39). Performed UT of CRD housing to stub tube welds (J weld) and area of housing to be rolled. No indications. Roll repaired both leaking housings.
	Fall 1998 Fall 1996 Fall 1994	No inspection Performed.	Not made accessible.
In-Core Housing	Fall 2016	None	Not made accessible.
	Fall 2014	None	Not made accessible.
	Fall 2012	None	Not made accessible.
	Fall 2010	None	Not made accessible.
	Fall 2008	None	Not made accessible.
	Fall 2006	None	Not made accessible.
	Fall 2004	None	Not made accessible.
	Fall 2002	None	Not made accessible.
	Fall 2000	None	Not made accessible.
	Fall 1998 Fall 1996 Fall 1994	No inspection performed.	Not made accessible.
Dry Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.

	Fall 2010	Replacement	Replaced final 4 Dry tubes due to service life: IRM-15 and 16; SRM 22 and 23.
	Fall 2008	Replacement	Replaced 4 Dry tubes due to service life: IRM-12, 13, 14 and SRM-21.
	Fall 2006	Replacement	Replaced 4 Dry tubes due to service life: IRM-11, 17, 18 and SRM-24.
	Fall 2004	Visual	VT-1 of SRM 24 found tube not fully engaged in top guide. VT-1 of IRM 17 and IRM 18 found both tubes bowed.
	Fall 2002	Visual	No inspections required.
	Fall 2000	Visual	VT-1 five dry tubes. One found slightly bent – use as is. No findings on others.
	Fall 1998	Visual	VT-1 one dry tube, no findings
	Fall 1996	Visual	VT-1 one dry tube, no findings.
	Fall 1994	Visual	VT-1 four dry tubes, no findings.
Instrument Penetrations	Fall 2016 Fall 2014 Fall 2012 Fall 2010 Fall 2008 Fall 2006 Fall 2004 Fall 2002 Fall 2000 Fall 1998 Fall 1996 Fall 1994	Visual	VT-2 exam from vessel exterior. No findings.
Vessel ID Brackets	Fall 2016	VT-3	VT-3 of 2 guide rod wall brackets. No findings. VT-3 of 6 surveillance specimen brackets @ 30, 210 and 300 deg. No findings. VT-3 / VT-1 of all 4 Spargers and Nozzle Interface Areas. No changes in the indications for spargers at 45 and 135 deg.

	Fall 2014	EVT-1	Inspected all 4 dryer support brackets. Minor changes in wear patterns were evaluated for continued service.
	Fall 2012	None	No inspection required.
	Fall 2010	EVT-1	EVT-1 all feedwater sparger attachment wall bracket welds. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	EVT-1	EVT-1 both Guide Rod Brackets. EVT-1 all 3 Surveillance specimen brackets. No findings.
	Fall 2004	EVT-1	Inspected all 4 dryer support brackets. No findings.
	Fall 2002	EVT-1	All feedwater sparger attachment brackets. Both guide rod attachment brackets. All surveillance sample brackets (30, 210 and 300 degree locations) No indications on attachment welds.
	Fall 2000	EVT-1	All 4 dryer support brackets. Observed wear indications on brackets. No indications on attachment welds. All feedwater attachment brackets inspected. No indications on attachment welds. Cracks observed on feedwater sparger to end bracket welds (non-safety-related component) on 2 ends.
	Fall 1998 Fall 1996 Fall 1994	VT-1	VT-1 of accessible portions of weld on guide rod brackets, steam dryer brackets, surveillance sample brackets. All attachment welds; no findings.
LPCI Coupling	N/A	N/A	N/A
Fuel Support Casting	Fall 2016	Visual	VT-1 Inspection of 1 Fuel Support Casting Cell 26-47. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	Visual	VT-1 Inspection of 1 Fuel Support Casting. No findings.

	Fall 2010	Visual	VT-1 inspection of 2 CRGT Bases (support castings) for CASS program. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	None	None inspected.
	Fall 2004	None	None inspected.
	Fall 2002	None	None inspected.
	Fall 2000	Visual	VT-3 (2) support casting. No findings.
	Fall 1998	Visual	VT-3 (24) support castings. No findings.
	Fall 1996	Visual	VT-3 (25) support castings. No findings.
	Fall 1994	Visual	VT-3 (17) support castings. No finding
Reactor DM Welds (BWRVIP-75-A)	Fall 2014	UT - Auto	UT examined eight (8) dissimilar metal (DM) welds containing alloy 82/182. This included three (3) DM welds on the top head. No new findings identified.
	Fall 2012	UT - Auto	UT examined three (3) Category D nozzle to flange dissimilar metal (DM) welds containing alloy 82/182. No findings. UT examined one (1) Category C recirculation suction nozzle to safe end DM weld N1A. Found no change to previously identified flaw and updated the flaw evaluation for another 2 cycles.
	Fall 2010	UT - Auto	UT examined four (4) Category C nozzle to safe end dissimilar metal (DM) welds containing alloy 82/182. No findings.

	Fall 2008	UT – Auto	UT examined five (5) Category C nozzle to safe end dissimilar metal (DM) welds. One indication identified in N1A recirculation suction nozzle to safe end weld dispositioned as acceptable for 2 cycles in accordance with IWB-3600 flaw evaluation. The 0.21 inch ID connected indication was in the RPV nozzle to clad interface on the Reactor side of the Alloy 182 DM weld. The flaw evaluation was submitted to the NRC.

Note: All indications left "as is" were analyzed and structural margins were acceptable for continued service.

Reactor Internals Inspection History

Plant: **Peach Bottom Atomic Power Station, Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1994	UT & VT	Comprehensive UT Baseline of some Category "C" circumferential welds (H-2, H-3, H-4, and H-5) per BWRVIP-01, Rev. 0. Partial UT baseline of welds H-1, H-6, and H-7, w/ partial Enhanced VT-1 of H-6 OD. 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-6, and OD of H-4 and H-5. Full structural margins calculated using two cycles of crack growth for comprehensively examined welds, one cycle for welds with limited exams. No indications identified on H-2 and H-7.
	1996	UT	Comprehensive UT of welds H-1, H-6 and H-7 per BWRVIP-01, Rev. 1. Exams per BWRVIP-03. Indications identified on ID of welds H-1, H-6 and H-7, on OD of weld H-1. Full structural margins calculated using two cycles of crack growth. Reexaminations planned per BWRVIP-76
	2002	UT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76. Indications identified on each weld. UT of Vertical welds V-1 through V-4. No indications identified. Reexaminations scheduled per BWRVIP-76.
	2012	UT & VT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76, Rev. 1. Indications were identified on all horizontal welds. Horizontal welds H1, H2, H3 and H4

			were evaluated and found acceptable for continued service via a plant specific analysis performed by SIA. Horizontal welds H5, H6 and H7 were evaluated via Table 2-1 of BWRVIP-76. UT of vertical welds V-1 through V-8 were performed with one indication identified on the V-3 weld. The indication was determined to be acceptable for continued service. EVT-1 examinations were performed on the following: shroud ID of the H-4 weld at 045 degrees, the shroud ID intersection of the V-5 and H-4 welds at 090 degrees, shroud ID intersection of the V-6 and H-4 welds at 270 degrees. No indications were identified during the visual inspection of the core shroud.
Shroud Support	1992	VT-3	VT-3 examination of support leg stub welds. No indications identified. VT-3 examination of welds H-7, H-8, and shroud support cylinder. No indications identified.
	1994	VT-3	VT-3 of accessible portions of H-8 weld between Jet Pump #1 and #10. No indications identified.
		VT-1	VT-1 examination around perimeter of 0 deg. access hole cover. No indications identified.
		UT	UT examination of both access hole covers. No indications identified.
	1998	EVT-1	EVT-1 examination of both AHCs. No indications identified. EVT-1 of 10% of shroud support weld H-8, top side, no indications identified. EVT-1 of 10% of shroud support weld H-9, top side, no indications identified.
	2000	EVT-1	EVT-1 examination of both AHCs. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 0° and 180° Azimuth. No indications identified.

	2002	UT	UT of 10% of H-9 weld length from OD of vessel. No indications identified.
	2004	EVT-1	EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 180° and 360°. No indications identified
	2008	EVT-1	EVT-1 examination of both AHCs. No indications identified.
	2010	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		UT	BWRVIP-180 baseline UT exams were completed on both AHCs. No indications identified.
	2012	EVT-1	EVT-1 of the H-9 weld was performed on the 157.5°-202.5° and the 337.5°-022.5° degree segments of the weld. No indications were identified. Note: Examination coverage of the H-9 weld was greater than 10% of the weld.
	2016	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of 10% of shroud support weld H-8, the 157.5 -202.5 deg and 337.5-022.5 deg segments of the weld. No indications identified.
Core Spray Piping	1980 to 1996	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.
	1996	VT-1 (1/2 mil)	EVT-1 (1/2 mil resolution) performed on annulus piping welds per BWRVIP-18. Cracking identified in "B" Header tee-box cover plate weld (P2B). UT performed to characterize indication.

			Evaluation demonstrated structural margin for one operating cycle
	1998	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique. EVT-1 used to supplement UT. No new indications identified. P2B weld reexamination yielded additional margin.
	2000	EVT-1	EVT-1 of nine (9) piping welds not previously UT'd, and of six (6) pipe brackets and attachment welds. No indications identified.
	2002	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (28 welds). EVT-1 used to supplement UT (6 welds). EVT-1 on two (2) support brackets. No new indications identified. P2B weld indication reexamination revealed minimal growth.
	2004	EVT-1	EVT-1 of twelve (12) piping welds not accessible for UT inspection. No indications identified
	2006	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). EVT-1 used to supplement all one-sided UT (12 welds). EVT-1 only on eight (8) pipe welds and six (6) support brackets. P2B weld indication reexamination revealed no growth. New 9/16" indication identified visually at intersection of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.
	2008	EVT-1	Re-inspection per BWRVIP-18, EVT-1 used on (21) pipe welds. P2B weld indication re-examination revealed no growth. The P3B1 9/16" indication revealed no growth. New indication (0.49") identified visually on the upper side of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.

	2010	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). Two sided UT performed on selected P4 elbow welds. EVT-1 used to supplement all one-sided UT on T-box welds (8 welds). P2B weld indication reexamination revealed no growth. P3B1 indications identified some change in measured size due to better cleaning and exam video resolution. . Structural and leakage evaluations found flaw acceptable for continued service.
	2012	EVT-1	EVT-1 examination of 17 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2014	EVT-1	EVT-1 examination of 33 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2016	EVT-1	EVT-1 examination of (7) pipe welds. The examinations re-identified indications on the P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for one cycle. All other examinations identified no indications.
Core Spray Sparger	1980 to 1994	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13, Cracking discovered at tee-box to sparger pipe weld ("B" Sparger, 1982), bolted repair clamp installed. No other indications identified.
	1998	VT-3 & MVT-1	Reinspections per BWRVIP-18, no indications identified.
	2000	EVT-1	EVT-1 of selected sparger welds per BWRVIP-18. No indications identified.

		VT-1	VT-1 of sparger tee-box repair clamp, and approx. 50% of sparger "C" and "D" nozzles and drains. VT-1 of eleven (11) sparger brackets and welds. No indications identified.
	2002	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of seven (7) sparger pipe welds. No indications identified.
	2004	VT-1, EVT-1	VT-1 of six (6) Sparger support bracket welds, one (1) sparger drain, and 50% of nozzles on spargers "C" and "D". EVT-1 of fifteen (15) Sparger pipe welds. No indications identified.
	2006	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2008	EVT-1, VT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. EVT-1 of ten (10) sparger pipe welds. No indications identified.
	2010	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2012	VT-1, EVT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. One recordable indication was identified on sparger bracket 04. The indication was defined as deformation on the top, middle and lower brackets. The deformation was concluded to be minor and would not impact the ability of the bracket to support the sparger piping. EVT-1 of six (6) sparger pipe welds identified no indications.

	2014	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
Top Guide (Rim, etc.)	1976 to 1994	VT-3	VT-3 exam every other refueling outage per Section XI. No indications identified.
	1987	UT	UT examination performed of specific cells. No indications identified.
	1994	VT-3	Visual (VT-3) examination of 4 cells (48-41, 08-25, 24-17, and 24-25), per SIL 554. No indications identified.
	1996	VT-3	Visual (VT-3) of 2 aligner pins (0 deg. And 270 deg.), per SIL 588. No indications identified.
	2012	EVT-1	EVT-1 examinations were performed on nineteen (19) top guide cells in accordance with BWRVIP-183. No indications were identified.
Core Plate (Rim, etc.)	1996	VT-3	VT-3 examination of all accessible hold down bolts (cell 16-57, and area at 0 and 270 deg. Azimuth. No indications identified.
	2010	VT-3	VT-3 examination of 16 core plate plugs. No Indications identified.
	2012	VT-3	All 129 core plate plugs were replaced with the new design. VT-3 of nine (9) core plate bolts was performed. No indications were identified.
SLC	1992	PT	Surface (PT) examination of nozzle to safe end weld per Section XI. No indications identified.
	1998	PT & UT	PT and UT of N10 nozzle to safe-end, no indications identified.
	2002	PT	Extended dwell time Liquid Penetrant examination of entire safe end.

			No indications identified.
	2006	PT	Extended dwell time Liquid Penetrant examination of entire safe end. No indications identified
	2010	UT-E	SLC Nozzle to safe end weld. No indications identified.
Jet Pump Assembly	1976–1996	VT-3	Visual VT-3 of all jet pump components performed every other refueling outage.
	1981	VT & UT	VT and UT examination performed on all 20 hold down beams. No indications identified.
	1994	VT	Restrainer bracket wedge misalignment and wear identified on several wedges. Evaluations found condition acceptable without repair. One restrainer bracket set screw tack weld found cracked. Evaluations found condition acceptable without repair.
	1996	VT	Restrainer bracket wedge conditions and set screw tack welds remain unchanged, condition acceptable without repair.
	1998	MVT-1	MVT-1 of: RS-1 weld on all 10 risers; RS-2 & RS-3 welds on 6 of 10 risers. No indications identified.
		UT	UT of all 20 hold down beams. No indications identified.
	2000	EVT-1	EVT-1 of adjusting screw tack weld (jet pump 7) and RS-2 & RS-3 on 5 of 10 risers. No indications identified.
	2002	EVT-1	EVT-1 of fifty (50) Medium priority weld locations. EVT-1 of transition region of two (2) hold down beams. No indications identified
	2004	EVT-1	EVT-1 of forty one (41) medium priority welds, to complete 50% baseline inspections. No indications identified.

		UT	UT performed on all twenty (20) hold down beams (3 zones, BB-1, BB-2, and BB-3). No indications identified.
		VT-1	VT-1 on all twenty (20) Inlet Mixer main wedges. Thirteen (13) jet pumps exhibited additional wear at main wedge-to-restrainer bracket interface. Performed expanded scope of inspections on these jet pumps. Set screw gaps identified at five (5) jet pumps. No additional problems identified. Installed eight (8) slip joint clamps and three (3) set screw auxiliary spring wedges, to mitigate wear believed to be caused by vibration.
	2006	VT-1, EVT-1, VT-3	VT-1 of twenty (20) WD-1 locations. EVT-1 of five (5) IN-4 welds, and two (2) riser braces-to-vessel attachment welds. VT-3 of eight (8) Slip Joint Clamps and three (3) Auxiliary Spring Wedges. Expanded EVT-1 scope on three (3) jet pumps due to WD-1 findings.
	2008	UT	UT exams performed on all 20 jet pump hold down beams. No indications identified.
		VT-3	Visual inspections performed on 5 auxiliary spring wedges installed. No indications identified.
		EVT-1	EVT-1 of 50 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Expanded EVT-1 scope on one jet pump due to WD-1 findings.
		VT-1	VT-1 of twenty (20) WD-1 locations. Re-examined previously identified wedge wear with no apparent changes noted on 19 of 20 inspections. One main wedge had additional wear into the restrainer

			bracket. BWRVIP 41 expanded scope inspections were performed with no additional indications identified. One Slip joint clamp was installed on the affected Jet Pump.
	2010	VT-3	VT-3 of two slip joint clamps. No indications identified
		VT-1	VT-1 of all twenty (2) JP main wedges. No new/additional wear identified. VT-1 of all JP set screws for gaps. Minor gaps identified on seven JPs. Five (5) accepted for continued service by engineering analysis. Two (2) were corrected by tapping down on the main wedge.
		EVT-1	EVT-1 of 37 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Completed BWRVIP Letter 2009-202 required inspections.
	2012	VT-3	VT-3 of seven slip joint clamps. Minor wear detected on JP 15 slip joint clamp. Wear was acceptable for continued use and will be re-inspected next outage.
		VT-1	VT-1 of all twenty (20) JP main wedges. New wedge wear identified on JP 16 and accepted for continued use. New wedge rod wear identified and accepted for continued use on JPs 1, 2, 5, 10, 11, 12, 14, 17 and 20. VT-1 of three (3) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. VT-1 of set screw gaps were performed on seven (7) JPs. Five of the jet pumps had minor gaps which were acceptable for continued use by an engineering analysis.

		EVT-1	EVT-1 of 20 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser pipe to transition piece weld, riser brace leaf to RPV Pad Weld, riser pipe to restrainer bracket circumferential weld and the bottom of the nozzle casting to the top of the mixer assembly weld (IN-4). No indications identified.
	2014	VT-3	VT-3 of nine (9) slip joint clamps. Minor wear detected on JP 05 and JP 15 slip joint clamps. Wear was acceptable for continued use and will be re-inspected next outage. New slip joint clamps were installed on JP 16 and JP 20 as a result of new wear on the belly band, and restrainer bracket.
		VT-1	VT-1 of all twenty (20) JP main wedges. Slight new wedge wear identified on JP 16 and accepted for continued use. The wedges on the bottom side on JPs 13 and 16 appeared to be lower. New wedge rod wear identified and accepted for continued use on JPs 06, 13 and 20.
		VT-1	VT-1 of eight (8) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. The auxiliary wedges on JPs 10 and 18 were found in the over-travel and were replaced. The aux. wedge on JP20 was also found in the over-travel position and a slip join clamp was installed which resulted in no set screw gaps. Both aux wedges on the shroud side and vessel side on JP 20 were then removed.
		VT-1	VT-1 of set screw gaps were performed on jet pumps without a slip joint clamp or auxiliary wedge. All as-left gaps were acceptable for continued use and none exceeded the 0.010" criteria for installation of an auxiliary wedge.

	2016	VT-1	VT-1 of four (4) slip joint clamps. Minor wear detected on JP 05 SJC. Wear was acceptable for continued use.
		VT-1	VT-1 of (20) main wedges. New wedge rod wear identified on JP 03, 13 and 16 and accepted for continued use. The wedges on JPs 12, 14 and 20 appeared to be lowered.
		VT-3	VT-3 of three auxiliary wedges. Minor wear identified on JP 13 and 18 aux wedges and accepted for continued use.
		EVT-1	EVT-1 of 28 medium and high priority welds including riser pipe to riser brace welds, riser elbow to thermal sleeve, inlet and mixer connections, riser elbow to riser pipe welds etc. A 1 5/8" flaw was noted on JP11/12 RS-1 weld and was accepted as is with re-inspection next outage in 2018.
Jet Pump Diffuser	1998	MVT-1	MVT-1 of: AD-1 & AD-2 welds on 12 of 20 pumps, AD-3A & B welds on 11 of 20 pumps, and DF-2 weld on 10 of 20 pumps. No indications identified.
	2000	EVT-1	EVT-1 of AD-1, -2, -3a, -3b, and DF-2 on jet pumps 1 through 10. No indications identified.
	2002	EVT-1	EVT-1 of ten (10) High priority weld locations. No indications identified.
	2004	EVT-1	EVT-1 of eleven (11) medium priority weld locations, to complete 50% baseline inspections. No indications identified
	2006	UT	UT of ninety eight (98) Diffuser / Adapter welds and six (6) Inlet Mixer welds. One 2" indication found on DF-2 weld, JP 17. Structural and leakage evaluations found indication acceptable for continued service.

	2010	EVT-1	EVT-1 of JP 17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified.
	2012	EVT-1	EVT-1 of JP-17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified. This examination was a recommendation from the 2012 BWRVIP INPO review visit.
	2016	EVT-1	EVT-1 of (60) Diffuser / Adapter welds. Indications were identified on (11) Jet Pumps out of 20 AD-3a/b backing ring. Largest indication on JP03 ~3.6 inches. Indications were acceptable as is with re-inspection next outage.
		EVT-1	EVT-1 of JP-17 DF-2 weld from the OD to look for any visual indication of the flaw identified by UT in 2006. 40% coverage of the OD was achieved, all suspect areas were investigated and no indication was identified.
CRD Guide Tube	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified
	2002	EVT-1, VT-3	EVT-1 of three (3) welds on each of ten (10) Guide Tubes (locations 50-31, 42-11, 42-23, 42-51, 38-27, 38-35, 38-51, 34-23, 34-39, and 30-31). Some flow interference with examinations. VT-3 equivalent of anti-rotation pin on ten (10) Guide Tube locations. No indications identified
	2006	EVT-1, VT-3	EVT-1 of fifteen (15) CRGT welds, VT-3 of five (5) CRGT welds, verification of seventeen (17) CRGT alignment pins. One slightly bent pin identified. Pin remains functional. Condition found acceptable. No other indications identified.

	2008	EVT-1	EVT-1 of nine (9) CRGT welds. No indication identified. Also, verification of eight (8) CRGT welds and (8) CRGT alignment pins.
	2010	EVT-1	EVT-1 of four (4) CRGT welds. No indications identified. All BWRVIP-47 baseline examinations have been completed.
CRD Stub Tube	1992	VT-3	VT-3 examination of stub tube welds accessible from fuel cells 26-31 and 30-27. No indications identified.
In-Core Housing	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
Dry Tube	1984		All Dry Tubes replaced in 1984
	1994	VT-1	VT-1 examination of IRM Dry Tube 2D, at core location 37-32.
	1997	N/A	All IRM and SRM tubes replaced w/ Wide Range Monitoring tubes in 1997. No inspections required.
	2016	N/A	The 1997 WRNM replacement left four dry tubes as spares, with no detector installed. All four spare dry tubes were replaced in 2016.
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.
LPCI Coupling			N/A for this plant
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 per ASME Section XI. No indications identified.
	2000	EVT-1	EVT-1 of six (6) Core Spray piping brackets. No indications identified.
	2002	EVT-1	EVT-1 of two (2) Core Spray piping brackets, two (2) Steam Dryer support

			brackets, and five (5) Jet Pump Riser brackets attachment welds. No indications identified.
	2004	EVT-1	EVT-1 of two (2) Steam Dryer support brackets and three (3) Jet Pump riser brace attachment welds.
		VT-3	VT-3 of four (4) Steam Dryer hold down brackets and three (3) lower surveillance brackets. No indications identified.
	2006	EVT-1, VT-3, VT-1	EVT-1 / VT-3 of twelve (12) Feedwater Sparger attachment bracket welds. EVT-1 / VT-1 of two (2) Jet Pump riser brace-to-vessel welds. No indications identified. Minor anomalies incidentally identified on several FW Sparger bracket pins.
	2008	VT-3	VT-3 of 5 Feedwater Sparger end brackets and attachment pins
		EVT-1	EVT-1 of 2 Core Spray bracket attachment welds
	2012	VT-3	VT-3 of 6 feedwater sparger end brackets and attachment pins. Wear identified on 5 of the 6 feedwater spargers end brackets and/or attachment pins. Wear was acceptable for continued use.
		EVT-1	EVT-1 of 8 Core Spray bracket attachment welds. No recordable indications. EVT-1 of 4 steam dryer support brackets. No recordable indications.
	2014	EVT-1, VT-1, VT-3	EVT-1/ VT-3 of four (4) Steam Dryer support brackets. New wear was observed at locations 094 and 274 deg and acceptable with engineering evaluation. Previously noted wear was observed on 004 and 184 deg with no changes. EVT-1 of four (4) Jet Pump Riser brackets attachment welds. No indications identified.

			VT-1 of three (3) lower surveillance brackets. No indications identified.
	2016	VT-3 EVT-1	EVT-1/ VT-3 of four Steam Dryer support brackets. New wear was observed at all locations and acceptable with engineering evaluation. The wear is consistent with the new footprint of the replacement dryer versus the OEM dryer, with the 40% increase in weight. EVT-1 of (3) Jet Pump Riser brackets attachment welds. No indications identified. EVT-1 of 2 Feedwater sparger end brackets and attachment pins. Wear identified was acceptable for continued use.
Steam Dryer	2002	VT-1, VT-3	VT-1 of all drain channel welds. VT-1 of upper and lower dryer bank tie bar welds and baffle plate welds. VT-3 of dryer bank end and top covers, and instrument tubing and supports. One (1) central bank upper tie bar severed, and one (1) instrument tube support-to-baffle plate broken. Broken tie bar and instrument tube removed from dryer. New, stiffer tie bars welded to central dryer banks.
	2004	VT-1	VT-1 of five (5) replaced central bank upper tie bars, ten (10) original bank upper tie bars, and outer bank hoods @ internal reinforcing plates and end plate welds, per SIL 644, Supp.1. No indications identified.
	2006	VT-1	Completed all remaining BWRVIP-139 recommended inspections on seventy four (74) locations. One small indication (7/16") identified at base of drain channel vertical weld. No other indications identified.

	2008	VT-1	Re-examined small indication (7/16") identified at base of drain channel vertical weld. No change noted. No other indications identified.
	2010	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A re-examination of (six) key high stress (red) locations and five (5) tie bars. No indications identified. Examination of all four (4) lifting lugs. Indications identified on anti-rotation tack welds. Accepted continued service by engineering evaluation.
	2012	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A examination of eight high stress (red) locations and seven (7) tie bars. No indications identified in high stress locations. Existing deformation was identified in two of the tie bars and was accepted for continued service by an engineering evaluation. Examination of all four (4) lifting rod assemblies identified existing indications on each lifting rod assembly. These indications were accepted for continue service by engineering evaluation.
	2014	Replace-ment	As part of the EPU License Amendment Request (LAR), Exelon PBAPS replaced the Original Equipment Manufacturer (OEM) steam dryer with a 3-ring octagonal (Nordic style) Westinghouse dryer.
	2016	VT-3	General VT-3 as found was performed on: - Top and sides (incl. outside of skirt) - underside of RSD (incl. inside of skirt) - W and U channel guides - hold down rods and lifting rods - outer, middle and inner hoods - and support ring.

		VT-1	VT-1 of (71) recommended locations by the manufacturer. Indications were identified at bottom of the hold down rods on construction/ non-structural welds for all (4) HDRs and evaluated as acceptable as is with no repair. The welds will be reinspected next outage in 2018. No other indications identified.
Steam Separator	2006	VT-1	VT-1 examinations performed on a sample of upper and lower shroud head bolt support ring gussets. 12 of 24 lower ring gussets revealed degradation. No indications on upper support ring gussets. Indications acceptable for continued service.
	2008	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. 5 of 12 lower ring gussets with previously identified degradation had further crack growth and 4 lower gussets had new indications not previously identified. No indications were observed on the upper support ring gussets. All Indications are acceptable for continued service.
	2010	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. Slight growth at one previously identified indication. New indication identified on six (6) gussets. All new indications were minor and acceptable for continued service. Wear identified on one (1) shroud head bolt pin/window. SHB was removed.
	2012	VT-1	VT-1 examinations were performed on all mid support ring gussets with new indications identified. These indications were acceptable for continued service based on an engineering evaluation. VT-1 examinations were performed on three shroud head bolts with indications identified on all three.

			VT-1 of four upper support ring gussets revealed no indications. VT-1 of all four lifting lug assemblies revealed existing indications on all four assemblies. These indications were acceptable for continued service as a result of an engineering evaluation.
	2014	VT-1	VT-1 examinations were performed on all (24) mid support ring gussets with (4) new indications identified. These indications were acceptable for continued service based on an engineering evaluation.
		VT-3	VT-3 examinations were performed on all (31) shroud head bolts with indications identified on (13) SHB. These indications were acceptable for continued service based on an engineering evaluation. Three (3) new SHB were installed as part of EPU.
		VT-1	VT-1 of four upper support ring gussets revealed no indications and VT-1 of all four lifting lug assemblies revealed previously identified indications on all four assemblies with no changes.
	2016	VT-3	VT-3 of (5) shroud head bolts.
		VT-3	VT-1 of (4) upper support ring gussets and (8) middle ring gussets revealed indications that were acceptable for continued service based on an engineering evaluation.
		VT-1	VT-1 of all four lifting lug assemblies revealed previously identified indications with no changes.
Dissimilar Metal Welds (BWRVIP-75-A)	2008	UT-E (E = encoded)	Performed Manual UT on three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was not ID connected and determined to be a fabrication flaw after comparison to

			construction radiographs. Indication was found acceptable, no further analysis or repairs required.
	2010	UT-E	Performed Manual UT of three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. No indications were identified.
	2012	UT-E	Performed Manual UT of six (6) IGSCC Category D welds. Three of these welds were dissimilar welds. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was evaluated per the requirements of Table IWB-3514-2 of ASME Section XI and was found to be acceptable.
	2014	UT-E	Performed Manual UT of one IGSCC Category D dissimilar weld, 3-I-19R (RPV, Nozzle N9 to Cap). No indications were identified.
	2016	UT-E	Performed Auto UT of (3) IGSCC Category D DM weld and Manual UT of one IGSCC Category A DM weld. No indications were identified.

BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Fall 2016 Outages

June 2017

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Reactor Internals Inspection History

Plant: **Browns Ferry Nuclear Plant: Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	2005	UT	Baseline: UT (two-sided) examination of H1, H2, H3, H4, H5, H6, H7 performed per BWRVIP-76. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 83.0% / 0.0% H1 / Lower / 82.1% / 2.1% H2 / Upper / 81.8% / 0.4% H2 / Lower / 88.7% / 0.0% H3 / Upper / 88.7% / 0.0% H3 / Lower / 79.2% / 5.1% H4 / Upper / 90.0% / 20.1% H4 / Lower / 89.6% / 2.6% H5 / Upper / 91.3% / 1.2% H5 / Lower / 91.3% / 0.0% H6 / Upper / 91.9% / 0.0% H6 / Lower / 91.9% / 11.2% H7 / Upper / 91.4% / 12.0% H7 / Lower / 78.0% / 0.0%
	2016	UT	Reinspection per BWRVIP-76, UT (two-sided) examination of H1-H7; Baseline per BWRVIP-76, UT examination of V3 and V4. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 84.6% / 0.0% H1 / Lower / 87.8% / 1.2% H2 / Upper / 87.9% / 0.3% H2 / Lower / 87.0% / 0.0% H3 / Upper / 86.8% / 0.0% H3 / Lower / 86.9% / 5.8% H4 / Upper / 97.5% / 23.4% H4 / Lower / 98.3% / 4.8% H5 / Upper / 92.1% / 0.0% H5 / Lower / 92.7% / 0.0% H6 / Upper / 93.2% / 0.0% H6 / Lower / 100.0% / 4.2% H7 / Upper / 100.0% / 2.4% H7 / Lower / 100.0% / 0.0%

			V3 / CCW Side / 96.5% / 0.0% V3 / CW Side / 88.7% / 0.0% V4 / CCW Side / 87.8% / 0.0% V4 / CW Side / 87.7% / 0.0%
Shroud Support	2005	VT-1, VT-3	Access Hole Cover Welds at 0° and 180°: Replacement required prior to Unit 1 Restart - Both access hole covers replaced with bolted repair design per DCN 51193. VT-1 visual baseline exam performed to inspect nut to retainer tack welds only. VT-3 visual baseline exam performed to document the as-left condition of the AHCs. No relevant indications on either cover.
		EVT-1	Baseline inspection per BWRVIP-104 of the H8 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. No relevant indications.
		EVT-1, UT	Baseline inspection per BWRVIP-104 of the H9 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. Also performed UT from the outside surface of the RPV obtained from access of the N1A and N1B (Recirculation outlet nozzles) windows. Achieved coverage was calculated to be 19%. No relevant indications.
		VT-3	Baseline inspection per BWRVIP-104 of the H10 and H12 welds at 0 and 180 degrees. These inspections were performed through the access hole cover openings during the repair. No relevant indications.
	2008	VT-3	VT-3 visual inspection of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and

			the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
	2012	EVT-1	Reinspection of Shroud Support weld H-8 (EVT-1) at 0° and 180° per BWRVIP-38. No reportable indications were found.
	2016	EVT-1	Reinspection of Shroud Support weld H-9 (EVT-1) per BWRVIP-104. No reportable indications were found. Visual inspection per BWRVIP-180 (VT-1 from the top surface) and vendor recommendation (VT-3) of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
Core Spray Piping	2001	UT	Baseline inspection per BWRVIP-18: UT of T-Box welds @ 120 (P2) and 240 degrees (P2, CP3). UT of elbow and sleeve welds for Downcomers A through D (P4a, P4b, P4c, P5, P6, and P7). No relevant indications.
	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations (T-Box welds @ 120 (P1, AP3, BP3) and 240 degrees (P1, DP3), Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees). EVT-1 visual examinations of elbow and sleeve welds for Downcomers A through D (P4d, P8a, P8b). No relevant indications.
	2008	EVT-1	Reinspection per BWRVIP-18-A: EVT-1 visual inspections of T-Box Welds (P1 (120° & 240°), AP3, BP3, DP3) and Downcomer Welds (AP4d, A-D8a, A-D8b); no relevant indications were observed.
	2010	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds

			@120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. UT of elbow and sleeve welds (P4a, P4b, P4c, P4d, P5, P6, P7, P8a, & P8b) performed for Downcomers A through D. Two indications (1.04" and 2.20") observed on weld P4a on A Downcomer on the pipe side of the weld. Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R9 (2012). Supplemental EVT-1 visual inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2012	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
	2014	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees); no relevant indications were observed. UT of elbow weld P4a performed for Downcomer A and elbow welds P4a, P4b, P4c, & P4d performed for Downcomer B. Two indications observed on Weld P4a on Downcomer A were resized (0.40" and 2.37") and two additional indications were identified (0.52" and 0.23"). Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R11 (2016). UT of sleeve welds (P5, P6, P7, P8a, & P8b) performed for Downcomers A through D; no relevant indications were observed. Supplemental EVT-1 visual

			inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2016	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
Core Spray Sparger	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations of sparger welds (S1, S2, S4). BS2-R weld @ 9 degrees (Sparger to T-Box Weld, R side (Lower Sparger) recorded a crack adjacent to the weld and was structurally replaced by weld repair clamp per DCN 51193. AS2-R weld @ 354 degrees (Sparger to T-Box Weld, R side (Upper Sparger) recorded a pin hole adjacent to the weld and evaluated as "accept as is". Otherwise, no relevant indications.
		VT-1	Baseline inspection per BWRVIP-18: VT-1 visual examinations of sparger welds (S3a, S3b, S3c, Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees). No relevant indications.
	2008	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger welds (S1, S2, and S4) and VT-1 visual examinations of Sparger welds (S3a, S3b, and S3c) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2012	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger A, C, D welds (S1 and S2 [L & R]), and Sparger A, B, C, D welds (S4 [L & R]) and VT-1 visual examinations of Sparger A, B welds (S3a, S3b, and S3c [L & R]) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2016	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
Top Guide (Rim, etc.)	2005	VT-3	Baseline inspection (NON-BWRVIP): VT-3 visual examinations of Locations 4 (Grid Beam to Rim Top / Bottom Cover Plate Pins), 6 (Fuel Guard Weld and Bolting), 12 (Rim & Cover Plate Fabrication Weld), and 13 (Eye Bolt Boss). 1 area recorded as a condition on the plate (Location 12), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1	Baseline inspection (NON-BWRVIP): EVT-1 visual examinations of Locations 1 (Grid Beam & Beam to Beam Crevice Slot) and 10 (Rim Pins). 3 areas recorded as not acceptable (Location 1), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1, VT-1	Baseline inspection per BWRVIP-26: Inspected Rim Welds (Location 11) (EVT-1) and Aligner Pins (Locations 2/3) (VT-1) at all locations. No relevant indications.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
	2014	EVT-1	Baseline (2014) per BWRVIP-183: Location 1 (Grid Beam and Beam-to-Beam Crevice Slot) inspected for ten grid beam cells; no reportable indications.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
Core Plate (Rim, etc.)	2005	EVT-1, VT-3	Baseline inspection per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were EVT-1 inspected from the top side, and seventeen (17) holddown bolts (50%) were inspected from the bottom side with no reportable indications. All one hundred twenty-nine (129) plugs (Location 13) were VT-3 inspected; three plugs were replaced.
	2008	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Three (3) core plate plugs replaced during Unit 1 Recovery were VT-3 examined to confirm that the replacement plug was in place. No evidence of movement, wear, or misalignment was visible.
	2010	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2012	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2014	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2016	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
SLC	2007	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.

	2008	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
	2014	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
		UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
Jet Pump Assembly	2005	UT, VT-1	Baseline (2006) per BWRVIP-41, -138: UT of holddown beam locations BB-1, BB-2, and BB-3 (Jet Pumps 1 thru 20) - no reportable indications. Baseline (2005) per BWRVIP-41 of all High and Medium Priority Weld locations. Circumferential crack indication in backing ring for DF-3 weld (Jet Pump 19) will be inspected for change during U1C7 RFO in Nov. 2008.

			Baseline (2005) per BWRVIP-41: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); No wedge wear observed. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified nine (9) set screw gaps ranging from 12 to 35 mils in width. Two reportable linear indications identified on one of two set screw tack welds for Jet Pump Nos. 15 (shroud-side) and 16 (vessel-side). Nine (9) auxiliary wedges installed on Jet Pumps 2, 3, 4, 6, 7, 8, 10, 12, and 14.
	2008	VT-3	VT-3 visual examination of the holddown beam for Jet Pump #8 was performed in response to misalignment concerns raised during Unit 1 Recovery and an RFI identified during the October 2007 INPO BWRVIP Review Visit. There was a minor misalignment with the beam but no relevant indications were observed. VT-3 visual examination of sensing line clamps installed during Unit 1 Recovery on Jet Pumps 1-5 and 11-15 performed to confirm that all of the repair hardware is in place and that the hardware has not shifted or changed from the as-installed condition. No relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was previously recorded during Unit 1 Recovery and does not appear to have changed.
		VT-1	Reinspection per BWRVIP-41 R1: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted. Indication of vertical wedge movement at ten (10) locations was observed, but the movement markings did not appear to be recent and correlated

			with findings during the Unit 1 Recovery examinations. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified no new set screw gaps. Inspection results identified eight apparently new set screw tack weld indications in addition to the two set screw tack weld indications that were previously observed during Unit 1 Recovery. Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery were inspected to verify contact; no relevant indications were observed.
	2010	EVT-1	Reinspection per BWRVIP-41, Rev. 3: EVT-1 of Medium Priority Locations RS-8 and RS-9 (Jet Pumps 1 thru 20) performed in accordance with BWRVIP Letter No. 2009-202 ("Interim Guidance for Accelerated Inspections of Jet Pump Riser to Riser Brace Welds and Wedges"); no relevant indications.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was unchanged from U1R7.
		VT-1	Reinspection per BWRVIP-41 R3: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted; three new instances of minor wedge wear since U1R7 noted at Jet Pumps 1, 6, and 10 determined to be the result of routing service during operation. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified one new set screw gap (Jet Pump 20: Shroud-Side Set Screw - 17 mils). Evaluation performed to provide one fuel cycle (U1C9) of continued operation.

			Inspection results identified two apparently new set screw tack weld indications on Jet Pump 17 in addition to the nine set screw tack weld indications that were previously observed during U1R7 (NOTE: An indication that was identified during U1R7 for Jet Pump 14 was accidentally counted twice). Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle (U1C9).
	2012	UT, EVT-1, VT-1	Reinspection per BWRVIP-41 R3, -138 R1: UT of holddown beam locations BB-1 and BB-2, (Jet Pumps 1 thru 20) - no reportable indications. Reinspection per BWRVIP-41 R3: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, & RS-7 (Jet Pumps 1 thru 6); IN-4, MX-2, & DF-1 (Jet Pumps 1 thru 5); no reportable indications. EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, & AD-3b (Jet Pumps 1 thru 10); linear indication (0.5 inches long) observed in heat-affected zone above the AD-1 weld for Jet Pump 6 was evaluated using Jet Pump Flaw Evaluation Handbook and was deemed acceptable. Otherwise, no reportable indications. EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. An additional indication was observed when a stain was reclassified; both indications were unchanged from U1R8, however. VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on five jet pumps (Jet Pumps 1, 10, 12, 17, & 18);

			significant increase in wedge wear for Jet Pump 6 necessitated a repair (aux wedge installed on the Shroud-Side Set Screw (SS-SS) for Jet Pump 6 to stabilize the restrainer bracket assembly); RS-8 and RS-9 welds for Jet Pump 6 examined (EXPANDED SCOPE) to insure no degradation was present - no recordable indications.
	2012	VT-1	VT-1 performed of Set Screw Locations AS-1 and AS-2 for Jet Pumps 1 thru 20. Backlighting identified three (3) set screw gaps (1 existing and 2 new) one of which (SS-SS for Jet Pump 18) measured at 9 mils and the other two (Vessel-Side Set Screw) VS-SS for Jet Pump 17 & SS-SS for Jet Pump 20) each measured at 20 mils, which exceeded the 15-mil screening criteria for installation of an auxiliary spring wedge but did not exceed the 20-mil criteria above which the potential exists for high level jet pump vibration. Gaps were corrected by tapping down on main wedge, so no additional auxiliary wedges installed. 17 set screw tack weld indications (11 existing and 6 new) were identified during U1R9. SS-SS on Jet Pump 17 was found backed out to shroud wall due to tack weld failure. SS-SS was restored to its original position and repaired (staked and an aux wedge added). Four additional set screws (Jet Pump 11 VS-SS; Jet Pump 13 SS-SS, Jet Pump 15 SS-SS, and Jet Pump 16 VS-SS) were found to have both tack welds broken and were staked and an aux wedge added. Remaining set screws had only 1 of 2 set screw tack welds and were acceptable as-is.
	2014	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on nine jet pumps (Jet Pumps 1, 6, 8, 9, 10, 12, 16, 17, & 18. Observed downward movement of the wedge for Jet Pumps 9

			& 12 led plant to conservatively inspect unrepaired adjusting set screws for both pumps – no reportable indications; minor wedge wear on all other jet pumps was unchanged. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery and six (6) auxiliary spring wedges installed during U1R9 (2012) were inspected to verify contact; no relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; indication was unchanged from U1R9 in 2012. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R9 in 2012.
	2016	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); indications of minor wear on nine jet pumps (Jet Pumps 1, 2, 5, 6, 9, 10, 12, 16, & 17). Adjusting set screws (AS-1 and AS-2) for five jet of the pumps (1, 2, 6, 9, & 10) conservatively added to scope to ensure no vibration-related damage was occurring; no set screw gaps nor new tack weld cracking observed; no slip joint clamps were required to be installed.

			3gaps observed during last set screw gap inspection during U1R9 were reinspected (Jet Pump 17, VS-SS - no gap observed; Jet Pump 18, SS-SS - no gap observed; Jet Pump 20, SS-SS - 13-mil gap); no aux wedges were required to be installed. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Four (4) auxiliary spring wedges inspected as part of expanded scope had relevant indications, so all 15 aux wedges installed on Unit 1 were inspected. 14 of 15 wedges had minor wear but none was judged serious enough to prevent wedges from performing their design function.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed during U1R9 & U1R10 in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; after cleaning the indication was re-identified as a scratch. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R10 in 2014 and upon evaluation were determined to be acceptable for one fuel cycle.
Jet Pump Diffuser	N/A	N/A	Diffuser exams reported in above jet pump assembly inspection results.

CRD Guide Tube	2005	EVT-1, VT-3	Baseline per BWRVIP-47: 19 control rod guide tubes (10% of total) examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual examination of Locations CRGT-2 and CRGT-3; no reportable indications.
CRD Stub Tube	2005	VT-3	VT-3 examinations performed for accessible areas for 145 stub tubes at various core locations. No damage or distortion was noted.
In-Core Housing	N/A	N/A	N/A
Dry Tube	2006	VT	All twelve (12) SRM/IRM dry tubes replaced with modified design which is resistant to cracking. Inspections will be scheduled after dry tubes have reached the expected 20-year life (2027).
Instrument Penetrations	2007	VT-2	Visual leak check is performed during Unit Startup. No reportable indications reported.
	2008	VT-2	Visual leak check performed during Unit Startup. Leak observed in safe-end to pipe weld for N11B instrumentation nozzle was repaired with weld overlay.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2014	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.

		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported. Visual leak check performed during Unit Startup. No relevant indications reported.
Feedwater Sparger	2005	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications. VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2008	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2010	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor impact damage observed on 175° Bracket (acceptable as-is), but otherwise no relevant indications were observed (no pin wear).
	2012	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor wear observed under the retaining pin for the end bracket at one new location (55°) when compared to U1R8 (2010) inspection results. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R10 in 2014 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of

			any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R8.
	2014	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications.
		VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R11 in 2016 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R9 in 2012.
	2016	VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R12 in 2018 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R10 in 2014.
Vessel ID Brackets	2005	EVT-1	Jet Pump Riser Brace Welds (40) examined (EVT-1): No recordable indications.

			Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): Damage to upper right corner and an indication extending from the damaged corner of the dryer support bracket located at 274° was repaired during Unit Recovery. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications.
	2012	EVT-1	Jet Pump Riser Brace Welds (12, Jet Pumps 1-6) examined (EVT-1): No recordable indications.
	2014	EVT-1	Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications.
	2016	EVT-1	Jet Pump Riser Brace Welds (Jet Pumps 7-20) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): No recordable indications. Attachment weld at 184° only received a VT-3 examination due to heavy crud buildup and will be cleaned and inspected to the proper exam method during U1R12 in 2018. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications. Guide Rod RPV Attachment at 0°: Indication on tack weld at the upper guide bracket to the Guide rod observed during Section XI Code examination.
LPCI Coupling	N/A	N/A	Not applicable to this plant

Steam Dryer	2005	VT-1	Full baseline inspection performed in accordance with BWRVIP-139 and GE SIL 644 R1. Three Drain Channel Vertical Welds were found to have indications, and were repaired with weld overlays.
	2008	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were VT-1 visually examined and confirmed. No change in condition was noted from what was previously reported. General visual inspection (pre-EPU baseline) performed in accordance with BWRVIP-139 and GE SIL No. 644 R1; no relevant indications were observed.
	2008	VT-1	In preparation for ascension to EPU and operation at EPU conditions, various steam dryer modifications were performed. All thirteen (13) Steam Dryer Tie-Bars were replaced with a new design and three (3) additional steam dam gussets on each steam dam were added to the Steam Dryer. A visual (VT-1) inspection was performed to document the as-left condition.
	2010	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R7.
	2012	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R8. Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed

			condition; no relevant indications were observed.
	2014	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R9 (2012).
	2016	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R10 (2014). Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed condition; no relevant indications were observed. Four (4) BWRVIP-139-A "Red Welds" (welds associated with dryer integrity) were visually inspected (VT-1). Three of the welds were found to have been removed during U1R7 modifications, the fourth had no relevant indications when examined.
Steam Separator	2010	VT-3	Steam Separator tie bars (cross bracing) examined for signs of cracking (Reference: INPO OE 30657). No relevant indications were observed on the cross bracing, but a minor dent was recorded at the top of a standpipe located in the southeast corner of the separator that was acceptable as-is.
DM Welds - BWRVIP-75-A Cat. C	2008	UT	3 welds inspected (RCRD-1-33, CS-1-002-008, CS-1-002-033A): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).

	2012	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R10).
	2016	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R11).
DM Welds - BWRVIP-75-A Cat. D	2008	UT	2 welds inspected (DRHR-1-2, DRHR-1-11): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).
	2012	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 10 (U1R10).
	2016	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 11 (U1R11).

Reactor Internals Inspection History

Plant: **Cooper Nuclear Station**

Component in BWRVIP Scope	Date of Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud	Fall 1995 (RE15)	UT	Baseline UT performed on welds H1 through H7 per BWRVIP guidelines. Indications identified in 4 circumferential welds. No examinations on vertical welds. No repair required.
	Spring 2005 (RE22)	UT	UT examinations were performed on welds H-1 through H-4 including a portion of vertical weld V16. Examination of welds H5-H7 was deferred to fall 2006. Single sided UT examinations were performed on welds H-1 through H-3 with welds H-4 and vertical weld (V-16) receiving dual sided examinations. Percentage of welds examined: H1 (54.9%), H2 (55.7%), H3 (63.9%), H4 (58.4%). The previously identified eight (8) flaws in H1 showed a net decrease in length. No new flaws in H2 were identified. The eight (8) flaws in H3 were reexamined with one (1) new flaw identified for a total increased change in flaw length relative to total weld length of 7.5 %. Two (2) new minor flaws were discovered in the HAZ of H4. In addition, a total of eleven (11) minor indications were identified in the base metal adjacent to H4. Six (6) of the indications exhibited characteristics associated with Stress Corrosion Cracking (SCC) in areas subjected to cold working during the shroud fabrication/installation process. The remaining five (5) indications did not exhibit characteristics of SCC but appeared to exhibit characteristics commonly observed from localized attachment removal sites. The indications were determined to be acceptable by analysis. No indications were observed in the vertical weld.

	Fall 2006 (RE23)	UT	UT examinations were performed on welds H5, H6a, H6b, and H7 using phased array. Two (2) sided examinations were performed on all welds except H7 that received a one-sided UT examination. Coverage was estimated at greater than 72% for welds H5, H6a, and H6b. H7 received greater than 53% coverage. A previously identified indication in H5 was re-examined with no apparent change. A previously identified indication in H6a was re-examined with no apparent change. A new minor indication was discovered in weld H6b in an area previously scanned in RE16 (1995). Two (2) new minor indications were discovered in weld H7, one in a previously scanned location and the other in an area not previously scanned.
		VT-3	VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Discovered an indication approximately ten (10) inches long behind JP-19. Analyzed as acceptable.
	Spring 2008 (RE24)	VT-3	Performed first ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Spring 2011 (RE26)	VT-3	Performed second ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Fall 2014 (RE28)	UT	UT exams were performed on the H1 thru H7 welds along with the V16 and base material flaw behind JP19. The previously identified indications showed no apparent changes in growth and none were through wall.
			VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Also performed third ASME B-N-2 VT-3 successive examination of flaw

			discovered in base metal behind JP-19. No changes in the indication.
Shroud Support/ Access Hole Covers	1993-1995	VT-3 and UT	VT-3 examinations of welds on 50% of core plate each outage. No indications. UT of access hole covers (AHC) in 1993. No indications.
	Spring 1997 (RE17)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC in accordance with GE SIL 462. No indications.
	Fall 1998 (RE18)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 of AHC's in accordance with GE SIL 462. No indications. VT-1 of gusset plate welds between 0-180° to B-N-2.
	Spring 2000 (RE19)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC's in accordance with GE SIL 462. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on 17% of the H8 and H9 welds. EVT-1 examinations on 6 gusset welds and AHC's. No indications.
		UT	UT examination of AHC's. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examinations on four (4) gusset welds. No indications.
	Spring 2005 (RE22)	UT	UT examinations on 11.7% of the H9 weld length. No indications
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations performed on approximately 16% of H8 weld length with no relevant indications. EVT-1 examinations of AHC per SIL462. No indications.

	Spring 2008 (RE24)	EVT-1	EVT-1 examinations performed on accessible lengths of welds on seven (7) gussets. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 examinations on 16.7% of the H8 weld. EVT-1 examinations on accessible lengths of welds on two (2) gussets @ 195° and 315°. No indications.
	Fall 2014 (RE28)	UT/EVT-1	UT performed on H9 with 13.4% coverage. EVT-1 performed on both AHC's. No indications.
Core Spray Piping	1980's to 1995	VT-1/VT-3	IEB 80-13 examinations of piping and welds in annulus. Three (3) indications identified in Fall 1995 outage by EVT-1. No repair required.
	Spring 1997 (RE17)	UT	UT examination of CS P8a and P8b welds. Indications on one P8a and P8b welds (first discovery). Evaluated as acceptable.
		EVT-1	EVT-1 examinations on balance of piping.
	Fall 1998 (RE18)	UT	UT examinations on the P8a and P8b indications were re-examined.
		EVT-1	Balance examined by EVT-1. No visual indications.
	Spring 2000 (RE19)	UT	UT examinations on P8a and P8b welds with indications. No repair required.
		EVT-1	EVT-1 of P3, P4, P5, P6, and P7 welds. No visual indications.
	Fall 2001(RE20)	UT	UT examinations on P3's, three (3) P4's, P5's, P6's, P7's, P8a's and P8b's. EVT examinations of thirty-one of the CS piping welds.
		EVT-1	EVT-1 examinations on fifteen (15) welds. Indications re-examined on P8a weld and P8b welds.
	Spring 2003 (RE21)	UT	UT examinations on all P8a and P8b welds. Identified three (3) flaw indications on one P8b weld and one (1)

			flaw indication on one P8a weld. No change in length.
		EVT-1	EVT-1 examinations on both junction box covers and accessible portions of both P1's, 2 - P2's, 4 - P3's, 1-P4a , 1-P4b, 1-P4c, 1-P4d. EVT-1 all P8a and P8b welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations of both P1's . The examination revealed that the P1 weld is not a creviced weld based on the presence of an external weld on the tee box near the nozzle thermal sleeve. EVT-1 examinations were performed on both P2 welds, the four (4) P3 welds, the 4a – 4d welds at 190° , the P5's, P6's, and P7's, the four (4) P8a's, and four (4) P8b's.
	Fall 2006 (RE23)	UT	UT examinations of P8b welds. Previous indications showed no change in size.
		EVT-1	EVT-1 examinations of piping welds and bracket attachment welds. No new relevant indications observed.
	Spring 2008 (RE24)	EVT-1	EVT-1 of indication near P1 at 90°. No change. EVT-1 of P1 at 270°. EVT-1 of P2's and P3's at 90° and 270°. EVT-1 of P4a, -b, -c, and -d at 170° EVT-1 of P5's, P6's, and P7's at 10°, 170°, 190°, and 350°.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations near P1welds at 90° and 270°. No change with the indication near the P1 at 90° (Loop A). EVT-1examinations of the four (4) P3, P5, P6 and P7 welds, EVT-1 examinations of downcomer welds P4a, P4b, P4c, and P4d at 10° . EVT-1 examinations of four (4) P8a and P8b welds. No change with visual indication of P8b at 10°.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.

	Spring 2011 (RE26)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° (Loop A). No change to the indication. EVT-1 of area adjacent to P1weld at 270°. No indications. EVT-1 of the P2 welds at 90° and 270°. EVT-1 of the four (4) P3, P5, P6, and P7 welds. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 190°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a, & P3b @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. No indications. EVT-1 of area adjacent to P1weld at 270° on B Loop,. No indications. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 350°. No indications. Loops A & B, EVT-1 of the bracket attachment welds PB @ 30°, 150°, 210°, and 330°. No indications.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.
	Fall 2014 (RE28)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a & P3b welds @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 170°. No indications observed.

			Loop B EVT-1 of area adjacent to P1weld at 270°. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. No indications observed.
	Fall 2016 (RE29)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 10°. No indications EVT-1 of two (2) P8a and two (2) P8b welds at 10° and 170°. No change with visual indication of P8b at 10°. Loop B EVT-1 of two (2) P8a and two (2) P8b welds at 190° and 350°. No indications.
Core Spray Sparger	1980's to 1995	VT-1/UT	IEB 80-13 of welds on sparger. No indications.
	Spring 1997 (RE17)	EVT-1	EVT-1 examinations of sparger welds and brackets per BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C identified. No other indications.
	Fall 1998 (RE18)	EVT-1	EVT-1 examinations of sparger welds and brackets inspected in accordance with BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C was reconfirmed. No other indications.
	Spring 2000 (RE19)	EVT-1	EVT-1 examinations of sparger and brackets. Five (5) indications evaluated as acceptable.
	Fall 2001 (RE20)	VT-1	VT-1 of 25% of S3a, S3b, and S3c welds. No indications.
		EVT-1	EVT-1 examinations of all S1, S2, and S4 welds examined with no indications.
	Spring 2003 (RE21)	VT-1	VT-1 of 25% of S3a & S3b's and all bracket welds. No indications.

		EVT-1	EVT-1 examinations of two S1,s, two S2,s, both XTRW welds near t-boxes, and four (4) S4 welds. No indications.
	Spring 2005 (RE22)	N/A	Sparger examinations deferred to fall 2006 (RE23).
	Fall 2006 (RE23)	VT-1	VT-1 on 50% of the S3a, S3b, and S3c welds and 100% on sparger brackets. No indications.
		EVT-1	EVT-1 on 100% of S1's and S2's and S4's. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 90°, 92°, 119°, 149°, 210°, 241° and 268°.
		EVT-1	EVT-1 examinations of S1's and S2's at 170° and 190°. EVT-1 examinations of S3a, S3b at 92° to 269°. EVT-1 examinations of S3c at 99°. EVT-1 examinations of S4's at 91° and 269°.
	Fall 2009 (RE25)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 272°, 299°, 30°, 329°, 61°, 88° and 270°.
		EVT-1	EVT-1 examinations of S1 and S2 and at 10° and 350°. EVT-1 examinations of two (2) additional welds near the 350° tee-box S2 welds.
	Spring 2011 (RE26)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications.
		EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4 @ 91° & 269°. No indications. EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4@ 91° & 269°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 on A sparger, S1 @ 10, S2 @ 8° & 12° and S4 @ 89° & 271°. No indications.

			EVT-1 on B sparger, S1 @ 350°, S2 @ 348° & 352°, XTRW welds near T-box @ 346° & 354°, and S4 @ 89° & 271°. No indications.
		VT-1	VT-1 on the B sparger, S3a & S3b @ 271°-89° and S3c @ 279°. No indications.
			VT-1 of the sparger brackets at 30.5°, 61°, 88°, 270°, 272°, 299°, and 329.5°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4@ 91° & 269°. No indications observed.
			EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4's@ 91° & 269°. No indications observed.
		VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets (SB) at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications observed.
Top Guide (Rim, etc.)	1991-1995	VT	VT of top guide beams of fifty (50) cells was performed in 1991 per RICSIL 059. No indications. VT exams of the members in the load path between the top guide and core shroud in 1995 per SIL 588. One (1) indication on the 90° aligner pin keeper was observed and evaluated as acceptable (indication not on load bearing portion of assembly).
	Spring 1997 (RE17)	VT -1	VT-1 re-examination of Top Guide Aligner Pin located at 90° in accordance with SIL 588, R1. Indication on aligner pin keeper did not appear to change in size.
	Spring 2000 (RE19)	VT -1	VT-1 of two (2) hold down assemblies. No indications.
	Fall 2001 (RE20)	VT -1	VT-1 of two (2) horizontal aligner pins with no new indications. VT-1 of four (4) hold down assemblies.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld.
	Fall 2006 (RE23)	VT-1	VT-1 on two (2) hold down assemblies and aligner pin assemblies at 90° and 270°. A previous indication identified on the non-load bearing keeper of the aligner pin assembly at the 90° location was observed with no apparent change. However, two (2) new but similar type indications were also observed on the same keeper. Three (3) new indications were observed on the non-load bearing aligner pin keeper at the 270° location. Indications were evaluated as acceptable.
		VT-3	VT-3 examinations performed on accessible areas of top guide per B-N-2. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 0 and 180°. One (1) new indication identified on non-structural keeper at 180°. Similar to indications in keepers seen at 90° and 270°. Evaluated as acceptable.
		EVT-1	EVT-1 examinations of accessible areas of Rim weld.
		VT-3	VT-3 examinations performed of accessible top guide hold down assemblies, rim pins per B-N-2.
	Fall 2009 (RE25)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 90°. No change in the indication at the 90° aligner pin keeper.
		EVT-1	EVT-1 examinations of 10% or fourteen (14) of top guide grid beams per BWRVIP-183. No indications. However, only eight (8) were credited as quality examinations.
		VT-3	VT-3 examinations of accessible areas of top guide per B-N-2.

	Spring 2011 (RE26)	VT-3	VT-3 of accessible areas of Top Guide per B-N-2. No indications.
		VT-1	VT-1 for BWRVIP-26 credit was performed on the Hold Down assemblies and Aligner Pin assemblies at 270°. An indication not previously reported was observed adjacent to the attachment weld adjoining the Aligner Block to the Top Guide. Indication appears to be a manufacturing remnant that was not completely removed during construction. Previously identified indications were also observed with no changes. Scope was expanded to include the remaining other three (3) Aligner Pin assemblies located at 0°, 90°, and 180°. VT-3 for Sect. XI B-N-2 and VT-1 for BWRVIP-26 credit was performed. Aligner Pin assembly at 0° was found to have seven (7) previously unidentified indications, with four (4) identified in the Aligner Pin Keeper and three (3) identified in the Aligner Block. Review of previous inspection video showed faint presence of indications. Evaluated as acceptable. Aligner Pin assembly at 90° was found to have one (1) previously unidentified indication located on the Aligner Pin Keeper. Review of previous inspection video showed a faint presence of the indication. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable. Aligner Pin assembly at 180° was found to have two (2) previously unidentified indications located on the Aligner Pin Keeper. Review of previous inspection video shows presents of indications. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld. EVT-1 of two (2) top guide cell locations per BWRVIP-183. No indications.
	Fall 2012 (RE27)	VT-1	VT-1 examinations performed on hold down assembly at 180°. No indications.
		VT-1	VT-1 of the aligner pin assembly at 0° was performed to confirm seven (7) flaws identified in RE26. Four (4) of the flaws on the keeper were confirmed and verified to have no changes. One (1) flaw on the aligner pin block was confirmed and verified to have no changes. The two (2) other previously identified flaws on the block were determined to be non-relevant surface scratches. VT-1 of the aligner pin assembly at 90° was performed to confirm seven (7) flaws identified on the keeper in RE26. 4 of the flaws were confirmed and verified to have no changes. One (1) additional flaw on the keeper was also reported. This flaw is similar to flaws seen on the other aligner pin keepers, but could not be verified in previous video due to camera positioning. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) flaws identified in RE26. All of the flaws on the keeper were confirmed and verified to have no changes. VT-1 of the aligner pin assembly at 270° was performed to confirm four (4) flaws identified in RE26. Three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) previously reported flaw adjacent the aligner block to top guide weld was examined using an improved camera and delivery mechanism and determined to be a non-relevant surface scratch.
	Fall 2014 (RE28)	EVT-1	EVT-1 examinations of accessible areas of Rim weld. No indications

		VT-1	VT-1 examinations performed on accessible top portion of the TG hold down assembly at 0°. No indications. VT-1 of the aligner pin assembly at 0° was performed to confirm five (5) previously identified flaws. Four (4) flaws on the keeper were confirmed to have no changes. The identified flaw on the aligner pin block showed slight increase in length. VT-1 of the aligner pin assembly at 90° was performed to confirm five (5) previously identified flaws. The 5 flaws on the keeper were confirmed to have no changes. Five (5) unreported flaws on the aligner block were detected. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) previously identified flaws. The three flaws on the Keeper were confirmed to have no change. Five (5) unreported flaws on the aligner block and two (2) on the top guide were detected. VT-1 of the aligner pin assembly at 270° was performed to confirm three (3) previously identified flaws. The three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) unreported flaw on the aligner block and one (1) on the top guide were detected.
		EVT-1	EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No crack indications identified.
	Fall 2016 (RE29)	EVT-1	EVT-1of five (5) of top guide grid beams per BWRVIP-183. No indications. EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No indications identified.

		VT-1	VT-1 of accessible top portion of the TG hold down assembly at 90°. No indications.
		VT-1/ EVT-1	VT-1 and EVT-1 of aligner pin assembly at 0° confirmed five (5) previously identified flaws. All flaws showed no changes, except for Flaw 6 on the keeper which appeared longer compared to previous examination but difference was attributed to improved tooling and lighting.. VT-1 and EVT-1 of aligner pin assembly at 90° confirmed ten (10) previously identified flaws on the keeper and block. All flaws showed no changes except for, Flaw 5 (keeper) and 10 (block) which appeared longer compared to previous exam with difference attributed to improved tooling an lighting. VT-1 and EVT-1 of aligner pin assembly at 180° confirmed nine (9) previously identified flaws. All flaws showed no changes, except for Flaws 2 and 3 on keeper which appear longer compared to previous exam with difference attributed to improved tooling and lighting. One (1) new flaw was reported on the block to slider weld that was later confirmed to be present in the previous exam. Change attributed to improved tooling and lighting. VT-1 and EVT-1 of aligner pin assembly at 270° confirmed five (5) previously identified flaws that showed no changes. One (1) new flaw reported on keeper to washer weld that was later confirmed to be present in the previous exam.
Core Plate (Rim, etc.)	Fall 1995	VT-3	VT-3 examinations of Hold down bolts examined in 1995 per SIL 588. No indications.
	Spring 2000 (RE19)	VT -3*	VT-3 examinations of 48 bolts examined from top side. *(Bolts are not accessible for EVT-1)

	Fall 2001 to Fall 2009 (RE20 – RE26)	VT-3	VT-3 examinations performed on accessible areas per B-N-2. No indications.
	Fall 2012 (RE27)	VT-3	VT-3 examination of three (3) hold down bolt locations (70, 71, and 72) from the top side. No indications.
	Fall 2014 (RE28)	VT-3	VT-3 exam of 36 (50%) hold down bolt locations from the top side. No indications.
SLC	1986-2001	VT-2	VT-2 examinations of SLC penetration during Class 1 RPV pressure test each outage.
	Spring 2003 (RE23)	EVT-2	Enhanced VT-2 examinations during Class 1 pressure test. No indications.
	Spring 2005 (RE22)	EVT-2/UT	Enhanced VT-2 performed of safe-end and penetration in conjunction with ASME Section XI Class I pressure test. Manual UT to Appendix VIII performed on nozzle to safe-end weld. No indications.
	Fall 2006 (R23)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2008 (RE24)	EVT-2	Enhanced VT-2 examinations performed of safe-end and penetration in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2009 (RE25)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2011 (RE26)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.

	Fall 2012 (RE27)	UT	UT examination of N10 SLC nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2014 (RE28)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
Jet Pump Assembly	1986-1995	VT-1/VT-3 /UT	VT examinations on ten (10) Jet Pumps each outage. Exam includes applicable GE SILS. Jet pump beams replaced in 1985. Jet pump beam UT first performed in 1993.
	Spring 1997 (RE17)	VT-1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Examinations deferred to Fall 2001.
	Fall 2001 (RE20)	VT-3	VT-3 examinations on all 20 jet pump nozzle inlets per SIL 465. No indications.
		VT-1	VT-1 examinations on all WD-1's. No indications.
		EVT-1	EVT-1 examinations on BB-1 and BB-2 on JP's 1-10. EVT-1 on MX-2's on JP's 1 – 10. EVT-1 on RB-1's and RB-2's on JP's 1/2, 3/4, and 5/6. No indications. EVT-1 on RS-1's, RS-2's, and RS-3's on JP's 1 – 10. EVT-1 on RS-6's on JP's 1, 3, and 5. EVT-1 on RS-7's on JP's 2, 4, and 6. EVT-1 on RS-8's and RS-9's on JP's 1/2, 3/4, and 5/6. No indications.
	Spring 2003 (RE21)	VT-3	VT-3 examinations on the JP nozzle inlet mixers on JP's 11 - 20 per SIL 465. VT-3 examinations of set screws, gaps, and tack

			welds on JP's 1 – 20 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on the IN-4 on JP's 5, 6, 11, 12, 13, and 14. EVT-1 examinations on the MX-2 on JP's 11, 12, 13, and 14. EVT-1 examinations on the RB-1's and RB-2's, on JP's 11/12 and 13/14. EVT-1 examinations on RS-1 and RS-2 on JP's 11/12, 13/14, 15/16, and 17/18; RS-6 on JP's 11 and 13; RS-7's on JP's 12 and 14; RS-8's and RS-9's on JP's 11/12, 13/14. No indications.
		UT	UT examinations on the BB-1's and BB-2's for JP's 1 – 20. No indications.
	Spring 2005 (RE22	VT-3	VT-3 on the JP nozzle inlet mixers on JP s 1 – 10 per SIL 465. No indications.
		VT-1	VT-1 examinations on JP set screws, gaps and tack welds on JP's 1, 2, 15, and 16 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on RS-1, RS-2, and RS-3 welds on JP's 1 and 2 and the IN-4 welds on JP's 7, 8, 9, and 10. No indications.
	Fall 2006 (RE23)	VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 9, 10. VT-1 of WD-1 at JP's 9, 10. No indications.
		EVT-1	EVT-1 of RS-1 and RS-2 on JP's 15/16 and 19/20.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of IN-4's at JP's 19 and 20. EVT-1 examinations of RB-1a's, -1b's, -1c's, and -1d's between JP's 9/10 and 19/20. EVT-1 examinations of RB-2a's, -2b's, -2c's, and -2d's between JP's 9/10 and 19/20. EVT-1 examination of RS-3 between JP's 19/20. EVT-1 examinations of RS-6 at JP's 9 and 19. EVT-1 examination of RS-7 at JP's 10 and 20. EVT-1 examinations of RS-8 and RS-9 at JP's 19/20 and 9/10. No indications.

		UT	UT of BB-1, -2 and -3 on all 20 JP beams. No indications. UT of MX-2 (and AD-1, AD-2, DF-1, DF-2, DF-3 note in Diffuser Section) on all 20 jet pumps.
	Fall 2009 (RE25)	VT-3	VT-3 of JP nozzle inlets per SIL465 on JP's 15, 16, 17 and 18. No indications.
		VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 10. 15, 16, 19, and 20. VT-1 of WD-1 at JP's 17, and 18. No indications.
		EVT-1	EVT-1 examinations of IN-4 on JP's 15, 16, 17, and 18. EVT-1examinations of RB-1's and RB-2's on JP's 7/8, 15/16, and 17/18. EVT-1 examinations on RS-1's and RS-2's on JP's 11/12 and 17/18. EVT-1examinations on RS-3's on JP's 11/12, 15/16, and 17/18. EVT-1 examinations on RS-6's on JP's 7, 15, and 17 and RS-7's on JP's 8, 16, and 18. EVT-1 examinations on RS-8's and RS-9's on JP's 7/8, 15/16, and 17/18. No indications.
	Spring 2011 (RE26)	VT-3	VT-3 of JP nozzle inlets on JP 9 and 10. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed.
		EVT-1	EVT-1 of RS-8 and RS-9 on JP-1 thru JP-14, JP-19, and JP-20. No indications. EVT-1 of JP-9 and JP-10's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-3, RS-1, RS-2. EVT-1 of JP-9's RS-6 and JP-10's RS-7. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of JP-13 and JP-14's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, & RS-3.

			EVT-1 of RS-6 on JP-13 and RS-7 on JP-14. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications. EVT-1 of JP-15 and 16's RS-3. No Indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1, 2, 9, 10, 13, 14, 15, 16, 19, & 20. No indications of movement or wear observed. VT-1 of the JP-15 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of 0.003" with no signs of movement. Vessel side set screw confirmed to have partial contact. No indications on slip joint. VT-1 of the JP-20 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of .004" with no signs of movement. Newly reported Vessel side set screw gap measured to be .013". No indications on slip joint.
		VT-3	VT-3 of JP nozzle inlets on JP-13 and 14. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of MX-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 of JP-1 and JP-2's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6 on JP-1 and RS-7 on JP-2. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed. VT-1 of the set screws and auxiliary wedges on Jet Pump 1, 2, 9, &10. JP10 had a previously identified shroud side gap that was found to be 0.011" with no

			signs of movement. JPs 1, 2, and 9 set screws and aux wedges were found to be in full contact with no signs of wear.
		VT-3	VT-3 of JP nozzle inlets on JP-1 and 2. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of MX-2 and IN-4 on JP-6. No Indications.
			EVT-1 of RS-1, RS-2, and RS-3 on JP-3&JP-4 and RS-1 and RS-2 on JP-7&JP-8. No Indications
			EVT-1 of JP-5&JP-6's RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, and RS-9. No Indications.
		VT-1	VT-1 of set screw gaps and slip joints on JP-15 and JP-20. No Indications.
			VT-1 of the JP Restrainer Wedge (WD-1) at JP-5 and JP-6. No indications.
		VT-3	VT-3 of JP nozzle inlets on JP-6. No indications.
Jet Pump Diffuser	1986-1998	VT -3	10 Jet Pumps VT-3 examined each outage. No indications. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT-1/VT-3	VT examinations on ten (10) jet pumps. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Exams deferred to Fall 2001.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on ten (10) jet pumps (5 assemblies). Identified an indication thought to be a broken jet pump sensing line upper bracket retaining weld. Evaluated as acceptable.

	Spring 2003 (RE21)	VT-3	VT-3 on JP sensing lines for all jet pumps per SIL 420. No indications.
		VT-1	VT-1 on sensing line brackets for all jet pumps per SIL 420. Previously reported cracked bracket weld was determined not to be cracked. No indications.
		EVT-1	EVT-1 examinations of AD-1, AD-2, AD-3a, AD-3b welds on JP's 11 through 20. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 on JP sensing lines for JP's 1 – 11 and 14 per SIL 420. No indications.
		VT-1	VT-1 on JP sensing line brackets for JP's 1- 11 and 14. No indications.
	Fall 2006 (RE23)	EVT-1	EVT- 1 on AD-1 on JP's 1, 2, and 5. EVT-1 examinations on AD-2, AD-3a, AD-3b, DF-1 on JP-15, 16, 17, 18, 19, and 20 and DF-2 on JP's 15, 16, 19, and 20. No indications.
	Spring 2008 (RE24)	UT	UT on AD-1, AD-2, DF-1, DF-2, and DF-3 (and MX-2). One (1) indication on DF-1 at JP-14.
		EVT-1	EVT-1 examinations on DF-1 at JP-14 in addition to UT. Appeared to be a defect from original construction.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of indication to DF-1 on JP-14 identified during the previous outage. No change.
	Spring 2011 (RE26)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication was found to have no changes.
	Fall 2012 (RE27)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication did not change.
	Fall 2014 (RE28)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-1, DF-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 re-examination of indication located on the inside surface of

			JP-14 at the DF-1 weld. Indication did not change.
	Fall 2016 (RE29)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-2 on Jet Pumps 3, 4, 5, 6, & 7. No indications. EVT-1 of DF-1 (outside diameter) on Jet Pumps 6 and 14. No Indications. EVT-1 of DF-1 (inside diameter) for re-examination of indication on the inside surface of JP-14. Indication showed no change.
CRD Guide Tube	Fall 1995	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 1997 (RE17)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Fall 1998 (RE18)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of eighteen (18) anti-rotation pins and eleven (11) CRGT-1 welds. No indications.
		EVT-1	EVT-1 examinations of four (4) CRGT-2 and CRGT-3 welds. No indications.
	Fall 2001 (RE20)	VT-3	VT-3 examinations of thirteen (13) anti-rotation pins and thirteen (13) CRGT-1 welds. No indications.
		EVT -1	EVT-1 examinations of five (5) CRGT-2 and CRGT-3 welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations on one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations of one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of two (2) CRGT-2 welds and three (3) CRGT-3welds. No indications.
		EVT-1	

	Fall 2009 (RE25)		EVT-1 examinations on one (1) CRGT-2 weld and two (2) CRGT-3welds. No indications.
CRD Stub Tube	N/A	N/A	No record of examination.
In-core Housing	NA	NA	No record of examination back to 1996
Dry Tube	1989-1991	VT	VT exam in 1989, 1990, and 1991 per SIL409R1. All dry tubes replaced in 1993.
	Spring 2005 (RE22)	VT	Replaced one (1) dry tube.
	Fall 2012 (RE27)	VT-1	VT-1 was performed on dry tube locations at 12-09 and 28-25. No indications.
	Fall 2014 (RE28)	VT-1	VT-1 performed on IRM dry tube locations at 20-25 and 36-41. No indication observed. Replaced IRM dry tube at 12-41.
	Fall 2016 (RE29)	VT-1	VT-1 on Dry Tube Locations. IRM 28-33 & 36-09 and SRM 12-33, 20-17, & 36-25. No Indications.
Instrument Penetrations	1986-2000	VT-2	VT-2 examination performed during RPV system leakage test each outage for all six (6) instrument nozzle penetrations. No indications.
	Spring 2000 (RE19)	PT	PT examination of N16A instrument penetration nozzle to safe-end weld.
	Fall 2001 (RE20)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2003 (RE21)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2005 (RE22)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
		UT	UT examination of N16 nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
	Fall 2006 (RE23)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.

	Spring 2008 (RE24)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2009 (RE25)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2011 (RE26)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2012 (RE27)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2014 (RE28)	UT	UT examination of N16B nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2016 (RE29)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
Vessel ID Brackets	1986-1995	VT -1/VT-3	ASME XI VT-3 (non-beltline) and VT-1 (beltline examinations) of jet pump riser brace, dryer, FW Sparger, Core Spray, guide rod, and surveillance capsule holder brackets performed once per interval. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
		EVT-1	EVT-1 examinations on four (4) CS bracket attachment welds. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of guide rod attachment welds. No indications.
		VT-1	VT-1 on FW sparger brackets. No indications.

		EVT-1	EVT-1 examinations on CS bracket attachment welds. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on all FW sparger bracket attachment welds and all dryer support attachment welds. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examination of on JP riser brace pad attachment weld at 150°. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 examination of steam dryer hold down brackets.
	Fall 2006 (RE23)	EVT-1	EVT-1 of eight (8) FW sparger brackets and four (4) CS piping bracket attachment welds. No indications.
	Spring 2008 (RE24)	VT-3	VT-3 of guide rod attachment welds. No indications.
		EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 30°, 150°, 210°, 270°, and 330°. EVT-1 examinations of steam dryer support bracket attachment welds at 215° and 325°. No indications.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 60°, 90°, and 120°. No indications.
	Spring 2011 (RE26)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 30°. No Indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of four (4) CS piping bracket attachment welds at 30°, 150°, 210°, and 330°. No indications. EVT-1/VT-1 of JP riser brace pad attachment welds at 270°. No indications. EVT-1/VT-3 of steam dryer support bracket attachment welds at 215° and 325°. No indications.

		VT-1	VT-1 of surveillance capsule holder brackets at 300°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of Riser Brace attachment welds on JP-1 & 2 at 150°. No indications.
		EVT-1/ VT-3	EVT-1/VT-3 of steam dryer support bracket attachment welds at 145° and 35°. No indications.
		VT-1	VT-1 of surveillance capsule holder brackets at 30° & 120°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 90°. No Indications.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	Fall 2001 (RE20)	VT-1	VT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2003 (RE21)	EVT-1	EVT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2005 (RE22)	VT-1	VT-1 of leveling screws per OE 16110
	Fall 2006 (RE23)	VT-1 w/Character Card	Performed baseline VT-1 examinations to BWRVIP-139 and SIL 644, Rev 2. Re-examined five (5) minor indications previously identified per SIL 474 adjacent to several drain channels. Two (2) new indications were observed in a weld adjacent to a drain channel and both tack welds on one (1) lifting lug were observed. The indications were evaluated as acceptable.
	Fall 2009 (RE25)	VT-1 (89)	VT-1 examinations on seven (7) previously identified indications on dryer. With additional cleaning, six (6) of the

			indications disappeared with only one (1) remaining (i.e., the cracked tack welds on one (1) lifting lug - no change in the lifting lug).
	Fall 2016 (RE29)	VT-1 (89)	Performed VT-1 examinations to BWRVIP-139-A. Re-examined one (1) previous indication of cracked tack welds on lifting lug @ 145° with no changes. The other three (3) lifting lugs were observed to have similar cracked tacks that were not previously reported. Five (5) Tie Rods were reported to be slightly bent with no broken welds. One (1) additional indication was observed on the lower guide bracket weld at 180° that extended into the skirt. The indication was arrested with a 5/8th inch Stop-drill hole. No other dryer indications reported.
Dissimilar metal welds	Spring 2008 (RE24)	UT	Automated UT performed on four (4) CAT A welds per Appendix VIII. Manual UT performed on two (2) CAT A welds. All welds included in Risk-Informed ISI Program. No indications.
	Spring 2011 (RE26)	UT	Manual UT inspection performed on one (1) CAT D nozzle to cap weld (CRD Return) per Appendix VIII and Risk-Informed ISI Program. No indications.
	Fall 2014 (RE28)	UT	Manual UT inspection performed on three (3). CAT A welds per Appendix VIII. All welds included in Risk-Informed ISI Program. No indications.
	Fall 2016 (RE29)	UT	Automated Phased Array UT performed on one (1) CAT D weld and manual UT performed on one (1) CAT A weld. Both welds included in Risk-Informed ISI Program. No indications.

Reactor Internals Inspection History

Plant: **Dresden 3**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Spray Piping	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of piping and welds in annulus. Indications observed at two lower elbow to pipe welds 2P4c and 4P4c. These welds were repaired using GE designed clamps.
	4/97-R14	UT/EVT-1	UT Baseline inspections per BWRVIP-18 of all piping circ welds in annulus. Repairs removed and not reinstalled. EVT-1 of any piping welds in annulus inaccessible to scanner. Additional flaws identified on 1, 2 and 3P8a welds.
	2/99-R15	EVT-1	EVT-1 examined undemonstrated welds P8a and P4d on all four downcomers. Installed a "bumper" repair on 1P8a at the 80° downcomer.
	9/00-R16	UT/EVT-1	UT of "Target" welds and EVT-1 of all undemonstrated welds. Also EVT-1 of welds made inaccessible from repair installed on the 80° downcomer including 1P7, 1P4c, 1P4d, 1P8a and b. Welds 2P4c and 4P4c exhibited flaw growth as predicted by Flaw Evaluation.
	10/02-R17	VT-1	Six P4 welds for presence of "excessive grinding". NRI. All undemonstrated welds P8a and P4d and long seams on thermal collars, NRI
	10/04 – R18	EVT-1	Examined piping welds 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b. Eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		NA	Performed Core Spray Lower Sectional Replacement (all four downcomers) eliminating welds 1-4P4c, 1-4P4d, 1-4P8a, 1-4P8b, 1-4P5, 1-4P6, and 1-4P7.
	11/06 – R19	VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of all accessible bolting, keepers, ratchets and latch springs. NRI - VT-3 of all repair hardware. NRI

		EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
	11/08 – R20	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 4P4a, 4P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI
	11/10 – R21	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI.
		VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of 4 bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/12 – R22	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 1P4a, 1P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. One RI due to partially cracked tack weld.
	11/14 – R23	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for two piping brackets. RIs on both brackets due to partially cracked tack welds.
		VT-1/VT-3	Core Spray Lower Sectional Replacements (all four lines) - VT-1 of bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/16 – R24	EVT-1	Examined piping welds: 1P1, 2P1, 2P2, 2P3, 3P3, 4P4a, 4P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for three piping brackets. RIs on two brackets due to partially cracked tack welds.

Core Spray Sparger	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of spargers and tee-boxes. NRI.
	4/97-R14	EVT-1, VT-3	Examined tee-box cover plate welds (S1), tee-box to sparger arms (S2), and sparger end caps (S4) to EVT-1. NRI. Examined sparger nozzles (S3) and the sparger piping to VT-3. NRI.
	10/00 - R16	EVT-1, VT-3	Per BWRVIP-18: EVT-1 of all S1, S2 and S4. VT-1 of 50% of S3. NRI.
	10/04 – R18	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			-All 12 sparger brackets and bracket to shroud welds. NRI. -Core Spray Lower Sectional Replacement (all four downcomers) eliminating inspection of the following welds: 1-4S1, 1-4S2a-b.
	11/08 – R20	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 1S3 (007-080°), 1S3 (080-183°), 2S3 (007-110°), 2S3 (110-183°). NRI.
			All 12 sparger brackets and bracket to shroud welds. One relevant indication identified. Indication acceptable for one cycle of operation.
	11/10 – R21	VT-1	One sparger bracket to shroud weld which had a previous indication identified in R20. No identified change. Indication acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			All 12 sparger brackets and bracket to shroud welds. No change observed on previously identified relevant indication.
	11/14 – R23	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.

	11/16 – R24	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.
Attachment Welds	4/94-R13	VT-1	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. NRI.
	10/00-R16	VT-1	ASME Section XI B-N-2, surveillance capsule holder attachments in beltline. All six sets examined. NRI.
	10/02 - R17	EVT-1	BWRVIP-48 attachments: four dryer lugs, eight feedwater sparger end-brackets, eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI
	10/04 – R18	EVT-1	Four steam dryer wall support lugs, lug to pad, and pad to vessel attachment welds. Eight feedwater sparger lug to vessel attachment welds. NRI.
		VT-1	Eight feedwater sparger end-bracket lug assemblies. NRI
	11/06 – R19	VT-3	Examined attachment welds for two Core Spray piping brackets and all four steam dryer wall support lugs in accordance with ASME Section XI. NRI
		EVT-1	Inspected piping bracket to piping weld and bracket to vessel attachment weld on 2 core spray piping brackets. NRI
	11/08 – R20	EVT-1 and VT-3	- Examined attachment welds for two Core Spray piping brackets. NRI - Examined surveillance capsule holder bracket attachment welds. NRI
		VT-3	Examined steam dryer and steam separator guide rod attachment welds. NRI
	11/10 – R21	EVT-1	Examined attachment welds for two Core Spray piping brackets and two steam dryer wall support lugs. NRI
	11/12 – R22	EVT-1	Examined attachment welds for all 8 feedwater sparger end bracket attachment welds. NRI
	11/14 – R23	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI
	11/16 – R24	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI

Core Shroud	4/94-R13	EVT-1 and UT	Inspections per SIL 572, extensive indications in circumferential welds.
	4/97-R14	EVT-1 and UT	Inspected all shroud repair design reliant structure prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspections consisted of EVT-1 of all ring segment welds (accessible surfaces), UT for minimum ligament of all vertical welds accessible to scanner and EVT-1 for minimum ligament on all accessible surfaces of all vertical welds not accessible to the scanner.
		NA	Installed four tie-rod shroud repair assemblies and four core plate wedges.
	2/99-R15	VT-1	Examined all four tie-rod assemblies and core plate wedges at locations specified by the manufacturer (GE).
	10/00-R16	UT	Examined a 40° segment of H4 to assist in shroud qualification of Core Spray Repair. NRI.
	10/04 – R18	EVT-1	Examined Ring Segment Welds V1-V4 (Shroud Head RSWs), V8-V13 (Top Guide RSWs), and V20-V25 (Core Plate Support RSWs). Historical indications at V23 and V25 revealed no apparent change since last inspection in R14 (indications are not in HAZ. All other RSWs NRI.
	11/06 – R19	UT	GE utilized the Telescoping Shroud Scanner to perform UT on Shroud vertical welds V5-V6, V14-V19, V26-V28. Coverage obtained as follows: V5 – 80.4% V6 – 34.8% V14 – 66.8% V15 – 75.6% V16 – 80.4% V17 – 77.9% V18 – 95.5% V19 – 69.8% V26 – 13.7% V27 – 69.4% V28 – 57.6% One indication identified on V27 (1.8" in length). Indication acceptable for continued operation in accordance with BWRVIP-76.

		EVT-1	Performed one-sided EVT-1 examinations on vertical welds. NRI. Coverage as follows: V7 – 40% V29 – 40% (between H7 and H8 welds) V30 – 0% (between H7 and H8 welds) V31 – 30% (between H7 and H8 welds) V32 – 0% (between H7 and H8 welds)
		VT-3, EVT-1	Performed GE recommended inspections of shroud repair hardware. Scope included inspections to address susceptible areas based on indications found at Hatch. One RI identified due to retainer clip not engage. This retainer clip is redundant and did not require repair.
	11/08 – R20	EVT-1	Examined historical indications at V23 and V25. No apparent change from previous inspection.
	11/10 – R21	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V1, V2, V3, V4, V8, V9, V10, V11, V12, V13, V20, V21, V22, and V24. Horizontal indications were identified in the top guide ring below H2, near V12 and V13. Indications acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V7, V29, V30, V31 and V32. Inspected previous indications V12, V13, V23 and V25. Indications evaluated as acceptable.
		EVT-1&VT-1	Inspected shroud repair hardware and core plate wedges at all four azimuths. RI-minor wear noted.
	11/14 – R23	EVT-1	- Inspected previous indications V12 and V13 with no change observed. - Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
	11/16 – R24	UT	Inspected shroud vertical welds V5-V6, V14-V19, V26-V28. One indication identified on V27 (1.8" in length). Indication acceptable in accordance with BWRVIP-76.
		EVT-1	- Inspected vertical ring welds V1-V4, V8-V13 and V20-V25. Indications noted on V12, V13, V21, V22, V23 and V25. Indications evaluated as acceptable. - Inspected shroud vertical weld V7. NRI

		VT-3	- Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
Shroud Support	4/94-R13	UT/VT-1	Access hole cover VT/UT for circ and radial flaws. NRI.
	4/97-R14	EVT-1	Examined H8 and H9 for about 12" at 4 locations of shroud repair hardware attachment areas. NRI.
	2/99-R15	EVT-1	Per BWRVIP-38: Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI. Requirements for this inspection cycle are satisfied. NRI.
	10/02- R17	EVT-1	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	10/04 – R18	EVT-1	Examined H8 and H9 between Jet Pumps 10 and 11 (132°-177°). NRI
	11/06 – R19	EVT-1, VT-3	VT-3 of accessible areas of H9 and EVT-1 of 10% of H9 (between Jet Pumps 10 and 11). NRI.
	11/08 – R20	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI.
	11/10 – R21	UT	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	11/12 – R22	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°) and Jet Pumps 10 and 11 (132°-177°). NRI.
SLC	10/02 - R17	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/06 – R19	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/10 – R21	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/14 – R23	UT	UT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
Jet Pump Assembly	4/94-R13	VT-1	Hold down beams, beam bolt keepers, lockplates 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. Prior to R13, visually inspect 100% of upper areas of each Jet Pump including beam retainers every other outage.

	4/94-R13	VT-1	Riser brace arm to yoke welds on three upper (secondary) riser braces found cracked. Repairs are not required. No other reportable indications.
			Diffuser to baffle plate welds on all twenty jet pumps. NRI.
	4/97-R14	EVT-1	All ten RS-1, 2, 3, 4 and RS-5. NRI.
	2/99-R15	EVT-1	Initiate BWRVIP-41: Medium Priority: 50% of DF-1, MX-1, MX-3 and IN-5 welds. All twenty RB-1, 2, RS-8 and RS-9. NRI. High Priority: 50% of DF-2, AD-1, 2 and 3. NRI.
		VT-1	Examined all twenty WD-1 locations. NRI.
	10/02-R17	EVT-1	Repeat examination of four DF-2 welds to improve coverage. NRI.
			Five RS-9 and 10 riser to secondary brace yoke welds, NRI. Eleven secondary brace RB-3 welds per ASME XI and BWRVIP-48. NRI.
	03/03-D3M09	VT-1	Verified acceptable restrainer set-screw gaps when replaced beams (reference Jet Pump Beams section of this report). Aux wedges installed two set-screw locations. The other locations were NRI.
	10/04 – R18	VT-1	Examined jet pump sensing line clamps on jet pumps 1, 2, 3, 10, 11, 12, 13, & 20.
		EVT-1	Examined all twenty WD-1 locations. Noted normal movement of wedges 11 & 20 with no abnormal wear. All other wedges NRI.
			Examined AS-1 (set-screw gaps) on five jet pumps: 8 (Vessel Side, Shroud Side), 9 (VS, SS), 11 (SS), 12 (VS, SS), 20 (VS, SS). No unacceptable gaps were identified (all less than 0.010").

			Examined AS-2 (set-screw tack welds) on five jet pumps: 8 (VS, SS), 9 (VS,SS), 11 (SS), 12 (VS, SS), 20 (VS,SS). Lack of fusion of tack welds was identified on jet pumps and set screws: 9 (VS), 11 (SS), & 13 (VS). Indications noted on the tack welds for 9 and 13 were accepted as-is for one-cycle. Jet pump 11 had a set screw missing from its housing. The set-screw was retrieved and an auxiliary wedge was installed. Also discovered during the inspection of jet pump 11 was a poor quality tack weld on the swing-gate keeper. The condition of the bolt keeper was accepted for one cycle.
			The auxiliary wedge installed during D3M09 on jet pump 13 was examined and historical cracking was re-identified on the set-screw mounting block. This indication is historical and was caused by the ejection of the inlet-mixer following the failure of a beam-bolt. The indication has been accepted as-is. Also discovered on jet pump 13 was a gap between the vessel side restrainer bracket and the swing gate. The condition of the bracket and swing gate was accepted for one cycle.
			Examined RS-10 & -11 on jet pumps: 2, 3, 4, 12, & 13. NRI. Examined RS-1, 2, & 3 on five jet pump pairs: 1/2, 3/4, 9/10, 11/12, 13/14. NRI.
		UT	Examined MX-3a&b, DF-1, -2 & -3 and AD-1, -2 on jet pumps: 2, 3, 4, 5, 8, 9, 12, 13, 18, & 19. NRI.
	11/06 – R19	EVT-1	Examined RB-1 & 2 on jet pumps: 1, 2, 3, 4, & 20. NRI Examined RS-4 & 5 on jet pump pairs: 9/10, 11/12, 13/14. NRI Examined RS-8 & 9 on jet pump pairs: 1/2, 3/4, 5/6. NRI Examined MX-1 and IN-5 on jet pumps: 1, 2, 3, 4, 5, 11, 12, 13, 14, and 15. NRI
		VT-1	Examined aux wedge on JP 11. RI for slight wear on JP 11 aux wedge. Justified continued operation for one cycle. Examined main wedge WD-1 on JPs 1, 2, 3, 4, and 11 for wedge wear. NRI.

		NA	- Installed new ratchet style swing gate on JP 11 to address degraded keeper tack weld identified in R18. - Staked threads due to cracked tack welds (found in D3R18) and installed aux wedges on JP 9 vessel side and JP 13 vessel side set screws.
	11/08 – R20	EVT-1	Examined RB-3 on JPs 1, 2, 3, 4 and 5. NRI
		VT-1	- Examined aux wedges on JPs 9, 11 and 13. RI for slight wear on JPs 9 and 11 aux wedges. Justified continued operation for one cycle. - Examined AS-1 on JP 9 SS and JP 11 VS. NRI - Examined main wedge WD-1 on JPs 1, 2, 7, 8, 9, 11, 12, 13, 14, 17, 18, 19 and 20 for wedge wear. One RI for a bent main wedge handle. Condition acceptable as-is. - Examined swing gate keeper tack welds on JPs 7, 8, 9, 10 and 20. NRI - Examined JPs 1 and 2 transition pieces and sensing lines to address operating trends. NRI - Examined JP 11 swing gate bolting and ratchets. Swing gate installed in D3R19. NRI
	11/10 – R21	EVT-1	- Examined AD-1, AD-2, AD-3a, AD-3b on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI - Examined MX-3a and DF-1 on jet pumps 1, 10, 11, 14 and 15. NRI. - Examined MX-3b and DF-2 on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI. - Examined RS-1, RS-2, and RS-3 on jet pumps risers 5-6, 7-8, 15-16, 17-18 and 19-20. NRI. - Examined RS-8, -9, -10, and -11 on all of the jet pumps. NRI. - Examined RB-1 on jet pumps 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19. NRI.

		VT-1	- Replaced an aux wedge on JP 11. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined (secondary) riser brace arm to yoke welds on jet pump 19. RI with the condition acceptable as-is. - Examined swing gate latches and welded keepers on jet pumps 4, 5, 6, 15 and 16. NRI - Examined sensing line clamps on jet pumps 1 and 20. NRI - Examined main wedge WD-1 on JPs: 3, 4, 5, 6, 10, 15 and 16 for wedge wear. NRI
	11/12 – R22	EVT-1	- Examined RB-2 welds on jet pumps 9-12 & 19. NRI - Examined RS-4 & RS-5 on JP risers 1/2, 17/18 & 19/20. NRI - Examined RS-2 on JP risers 1/2, 3/4, 9/10, 11/12 & 13/14. NRI - Examined MX-1 welds on JPs 6-10. NRI - Examined RB-3 welds on 5 JPs. NRI - Examined JP-11 BB-2. NRI
		VT-1	- Examined RB-3 welds on all 20 JPs. NRI - Examined WD-1 on JPs 1, 2, 8, 11, 12 & 14. NRI - Examined swing gate keeper tack welds on JPs 1, 12, 13, 14 & 19. NRI - Examined Aux wedges on JPs 9 & 11. RI - Some wear was observed. - Examined vessel side AS-1 on JP 11. NRI
		VT-3	- Examined IN-5 bolting on JPs 6-10. NRI - Examined slip joint on JP 11. NRI
	11/14 – R23	VT-1	- Examined WD-1 on all jet pumps. RIs for wear on jet pump 9 and bent bail handles on jet pumps 17 and 20. - Examined swing gate keeper tack welds on four jet pumps and swing gate ratchets on one jet pump. NRI - Examined Aux wedges on JPs 9 & 11. RI - Wear was observed with both auxiliary wedges. - Examined vessel side AS-1 on JP 11 and shroud side AS-1 on JP 9. NRI

		VT-3	- Examined sensing line clamps on six jet pumps. RI on JP 12 due to gap between clamp and sensing line standoff bracket. - Examined jet pump 9 slip joint. NRI
	11/16 – R24	EVT-1	- Examined MX-3a and DF-1 on jet pumps 6, 7, 16, 17 and 20. NRI. - Examined MX-3b on jet pumps 9, 12, 13, 18 and 19. NRI. - Examined AD-1, AD-2, AD-3a and DF-2 on jet pumps 2, 3, 4, 5, 8, 9, 12, 13, 18 and 19. NRI. - Examined RS-1 and RS-3 on jet pumps risers 1-2, 3-4, 9-10, 11-12 and 13-14. NRI. - Examined RS-8 and -9 on jet pumps 11-12, 13-14 and 15-16. NRI. - Examined RS-10 and -11 on jet pumps 1-2, 11-12 and 15-16. NRI. - Examined RB-1 on jet pumps 1, 2, 3, 4 and 20. NRI. - Examined AS-1 on JP 9 shroud side and JP 11 vessel side set screws. NRI.
		VT-1	- Replaced aux wedge on JP 11 and installed slip joint clamps on jet pumps 11 and 12. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined aux wedge on JP 13. Minor wear noted. - Examined main wedge WD-1 on JPs: 4, 5, 7, 10, 11 and 19 for wedge wear. NRI - Examined main wedge WD-1 on JP 9. No change to previous wear.
		VT-3	- Examined sensing line clamp on JP 12. No change to previous indication.
Jet Pump Beams	4/94-R13	UT	Jet pump beams are UT examined each outage using technique capable of detecting cracking at throat and ears. Original group 1 beams.
	4/97-R14	UT	Examined all beams. Two beams with indications replaced. Balance NRI
	2/99-R15	UT	Examined all beams. NRI
	10/00-R16	UT	Two beams with indications replaced with group 2 style beams. Balance NRI.
	03/03-D3M09	NA	Replaced all 17 original beams with weld-less keeper Group 2 beams.

	10/04 – R18	VT-3	Examined 17 group 2 beam bolt retainer mechanisms (weld-less keeper) to ensure all keepers were engaged. NRI.
		EVT-1	Examined 3 group 2 welded keeper style beams. BB-1 and BB-2 on Jet Pumps 5, 8, and 13. NRI.
	11/06 – R19	NA	Pre-emptive replacement of aging beams on JPs 5, 8 and 13 rather than UT examine.
	11/08 – R20	VT-1	- Examined beam ratchet engagement on JPs 5, 8 and 13 after 1 cycle of operation. NRI - Examined beam and ratchet engagement on JPs 1 and 2 to address operating trends. NRI
	11/12 – R22	UT	Examined BB-1, BB-2 and BB-3 on 18 of 20 jet pump beams (Group 2). NRI
	11/14 – R23	UT	Examined BB-1, BB-2 and BB-3 on jet pump 11 beam (Group 2). NRI
		VT-1	Examined all 20 jet pump beam retainer clips. NRI
LPCI Couplings	NA		
Lower Plenum	4/97-R14	MVT-1	CRD Stub Tube, CRD H7. NRI.
	4/97-R14	MVT-1	ICH/RPV-1 and ICHGT/ICH-1, two inspected from cell H7. NRI.
	10/00-R16	EVT-1	Per BWRVIP-47: examined CRGT-1, 2 and 3 on D10. NRI.
	10/02-R17	EVT-1 and VT-3	Examined 9 CRGT-1, 2 and 3 and FS/GT-ARPIN. NRI. This completes first 5% in 6 years.
	10/04 – R18	VT-3	Bottom Head Drain cleaning project created access for the following examinations: - Examined eight Stub Tube to Vessel Welds (ST/RPV-1) and eight Stub Tube to CRD Housing Welds (CRDH/ST-1) in cells: F7, G6, G7, G8, H7, H8, H9, and J8. NRI. - Inspected two locations for Core Plate to Stiffener Plate Stitch welds: G7 & G8 beam welds. NRI. - Examined two locations for Stiffener Plate to Stiffener Rods welds: G7 and H8 beam tie rods. NRI.
	11/08 – R20	VT-3	Examined 9 CRGT-1 and FS/GT-ARPIN. NRI. This completes 10%.

		EVT-1	Examined 9 CRGT-2 and 3. NRI. This completes 10%.
	11/10 – R21	VT -3	Installation of a plug in the bottom head drain to support drain line valve maintenance created access for the following examinations from cells G7 and H8: - Examined accessible portions of eight Stub Tube to Vessel (ST/RPV-1) welds, eight Stub Tube to CRD Housing (CRDH/ST-1) welds and eight CRD Housing to Cap (CRDH-1) welds. NRI. - Examined accessible portions of four In-Core Monitor Housing to Vessel (ICH/RPV-1) welds, four In-Core Monitor Housing to In-Core Housing Guide Tube (ICHGT/ICH-1) welds, two In-Core Housing Support Hardware to In-Core Housing Guide Tube (ICHS/ICGT-1) tack welds and four In-Core Housing Support (ICHS-1) hardware tack welds. NRI.
Feedwater Spargers (Not in BWRVIP Scope)	11/06 – R19	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on four brackets. Justified operation for one cycle. Inspected sparger repair hardware from D2R18 isokinetic probe retrieval. NRI
	11/08 – R20	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on five brackets. Justified operation for one cycle.
	11/10 – R21	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. No apparent change in wear from R20.
	11/12 – R22	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R21. Performed inspections of spargers, arm welds and t-box welds. RI - Dent on one nozzle.
	11/14 – R23	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R22.

Steam Dryer	10/04 – R18	"Best Effort" VT-1	- Examined exterior surfaces including outer hoods, historical repair areas, tie bars and attachment welds, four lifting assemblies, four hold down assemblies, two man way covers, cover plates, fourteen gussets, upper ring welds, vertical guide welds, outlet plenum lower horizontal welds, outlet plenum vertical welds, and perforated plates. Multiple indications identified, including structural fatigue flaws in the outer hood areas. Outer hoods modified to repair cracking. - Examined interior surfaces including: drain channel welds, supports, vertical and horizontal plates, support ring, horizontal cross beams, and horizontal cross beam gussets. Initial start-up steam sample probe discovered missing. Probe located and retrieved from steam separator. Multiple non-structural indications also noted.
		VT-3	Examined interior and exterior skirt. Indications noted.
	11/06 – R19	"Best Effort" VT-1	Performed VT-1 inspection of outer hood welds on old dryer where previous indications had been identified and repaired. NRI.
		NA	Installed new dryer.
	11/08 – R20	"Best Effort" VT-1	Examined critical components on steam dryer after one cycle of operation per GE recommendations. One RI where dryer contacted steam separator guide rod (RI on guide rod also). Dryer and guide rod indications acceptable for one cycle of operation.
	11/10 – R21	"Best Effort" VT-1 and VT-3	Examined critical components on steam dryer. The RI from R20 where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change on both the SS guide rod and the SD.
	11/12 – R22	"Best Effort" VT-1 and VT-3	- Examined critical components on steam dryer. The previous RI where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change. - Examined dryer support lugs. Minor indications noted due to contact with the dryer.

	11/14 – R23	VT-1	- Examined the previous RI where the dryer contacted the steam separator guide rod with no change noted on dryer and guide rod. - Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
	11/16 – R24	VT-1	- Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
Top Guide	4/94-R13	VT-1	Examined beam intersections in five cells in response to industry experience. NRI.
	4/97-R14	VT-1	Per BWRVIP-26, baseline examined all four top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at the four aligner assembly locations. NRI.
	10/00-R16	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined rim weld 11. NRI.
	10/04 – R18	VT-1	Examined 90° and 180° top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at 90° and 180°. NRI.
	11/06 – R19	EVT-1	Examined rim weld from cell 03-34. NRI
	11/08 – R20	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined top guide rim weld. NRI
	11/12 – R22	EVT-1	- Top guide rim weld was inspected at accessible locations. NRI - Top guide grid beams were inspected from 10% of the cells (18 cells). NRI.
		VT-1	The aligner pins and sockets at all four locations. Indications identified at all four aligner blocks. Indications evaluated as acceptable for one cycle.
	11/14 – R23	VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. No change to previously identified indications.
	11/16 – R24	EVT-1	Top guide rim weld was inspected at accessible locations. NRI
		VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. New growth was observed on one of the previously identified indications.

Vessel	10/02 – R17	UT	Examined vertical welds SC1A, SC1C, SC2B, SC3A, SC3B, SC3C, SC3D, SC4A, SC4B, SC4C, and SC4D. NRI.
	10/04 – R18	UT	- Examined vertical welds SC1B, SC2A, SC2C, SC3A, and SC3B. NRI. Satisfies third interval Section XI inspection requirements. - Examined two original vessel construction base metal repair areas in beltline as required by Section XI. NRI.
		VT-3	Inspected cladding in accordance with ASME Section XI. NRI.
	11/06 – R19	VT-3	Inspected the reactor vessel cladding from the shroud flange to the reactor flange in accordance with ASME Section XI. NRI
	11/12 – R22	UT	Examined all 14 vertical welds, the flange to shell circumferential weld and two original vessel construction base metal repair areas in beltline as required by Section XI. All identified indications acceptable per Table IWB-3510-1.
		EVT-1	Examined weld and heat affected zones on four level instrument nozzles. NRI
Nuclear Instrument Dry-tubes (Not in BWRVIP Scope)	4/94 - R13	VT-1	Identified one cracked dry tube (24-37). Replaced. Examined every other outage to date. Per Reutter-Stokes recommendations, have not reached manufacturer's service life.
	11/06 – R19	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/08 – R20	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/10 – R21	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. RI identified movement on one IRM between the plunger and the Top Guide. Rub marks were also noted on the plunger. Acceptable as-is.
	11/12 – R22	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/14 – R23	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI
	11/16 – R24	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI

Steam Separator (Not in BWRVIP Scope)	10/04 – R18	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear that was evaluated as-is for continued operation. Examined eight standpipe to shroud head welds and eight gusset to ring welds, NRI.
	11/10 – R21	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation. Replaced two SHBs. One of the two was missing the pin and the other had excessive pin to window wear.
	11/12 – R22	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/14 – R23	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/16 – R24	VT-1	Examined pin and window condition on 2 shroud head bolts. No change to previous wear.
Piping Welds (BWRVIP-75-A)	11/08 – R20	UT	Performed manual UT on four (4) IGSCC Category C welds and two (2) IGSCC Category A welds. None of these welds were dissimilar metal (DM) welds. No relevant indications identified.
	11/10 – R21	UT	Performed manual UT on six (6) IGSCC Category D welds. Five of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/12 – R22	UT	Performed manual UT on seven (7) IGSCC Category D welds. Four of these welds were on the reactor head spray system and three were on the reactor head vent system. Four of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/14 – R23	UT	Performed manual UT on nine (9) IGSCC Category C welds. None of these welds were dissimilar metal (DM) welds. No relevant indications were identified.

	11/16 – R24	UT	Performed UT exams on six IGSCC Category D welds. Two were on the HPCI system and four on the ISCO system. All six of these welds were DM welds. Five of the welds had automated exams performed. No relevant indications were identified.
Cast Austenitic Stainless Steel	11/12 – R22	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/14 – R23	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/16 – R24	EVT-1	Inspected one fuel support piece and one control rod guide tube base. NRI

Reactor Internals Inspection History

Plant: **Duane Arnold Energy Center**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1995	UT	Performed ultrasonic examination of the accessible areas. Baseline per BWRVIP-01, no indication were detected.
	2001	UT	Performed ultrasonic examination of the H1-H7 welds, no indications found.
	2010	Phased Array UT	Unable to complete the ultrasonic examination of the accessible areas due to equipment issues. Performed OD EVT-1 inspections to supplement and submitted Deviation Disposition to do the UT exams in 2012. No indications found.
	2012	Phased Array UT	Indication on H1 weld, approx. 1" long and 1/8" deep, ID. All other welds no indications.
Access Hole Covers	2012	Phased Array UT	Performed ultrasonic examination of 0° and 180° AHC. Two indications found on each AHC up to 70% through wall and 30% around. Evaluated in accordance with BWRVIP-180.
Shroud Support	1988/1993	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	1998	VT-3	VT-3 of shroud support.
	1999	VT-3	Shroud Support including H-8/H-9 (360 degrees).
	2001	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	2003	VT-3	Shroud Support including H-8/H-9 (180 to 360 degrees).

	2005	VT-3	Shroud Support including H-8/H-9 (0 to 180 degrees).
	2007	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of 180° of the shroud plate including both access hole covers – no indications.
	2009	VT-3	Shroud Support including the H-8/H-9 (0 to 180 degrees) – no indications.
	2012	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of H8/H9 – no indications.
Core Spray Piping	96 (portion every RFO)	VT	Performed Visual Examination (EVT, CSVT, VT-3), baseline per BWRVIP-18, no indications were detected.
	1998	EVT-1	Reinspection per BWRVIP-18 – no indications.
	1999	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2001	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2003	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2005	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2007	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2009	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2010	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2012	EVT-1	Reinspection per BWRVIP-18 – no indications.

	2014	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2016	EVT-1	Reinspection per BWRVIP-18 – no indications
Core Spray Sparger	96 (portion every RFO)	VT	Performed Visual Examination (CSVT, VT-3), baseline per BWRVIP-18, no indications were detected. One sparger nozzle is inspected every other RFO due to a missing tack weld.
	1999	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2001	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2005	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2009	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2012	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2014	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
Top Guide (Rim, etc.)	1995	VT-1 (1/2 mil wire)	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. 100% inspection of the grid locations has been completed over the past three RFOs.
	1998	VT-3	VT-3 0° location.
	1999	VT-3	Examined nine cells (top general and bottom of grid areas).
	2001	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect the two hold down assemblies.

	2003	VT-3	Examined five cells (top general and bottom of grid areas).
	2005	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect two hold down assemblies.
	2005	VT-3	Examined four cells (top general and bottom of grid areas).
	2007	VT-1	Performed VT-1 examination of the bottom side of eight grid locations – no indications.
	2009	VT-1 VT-3	Performed VT-1 of the Latches at 46° and 226° location. VT-1 of the fillet welds on the contour wedges at 90° and 270°. Was not able to obtain 100% coverage of the fillet welds on the contour wedges due to the fuel being in the way. Will re-schedule in 2010. Performed VT-3 of the top guide – no indications.
	2010	VT-1 VT-3	Performed VT-1 of the Latches at 136° and 316° location. VT-1 of the fillet welds on all contour wedges. Performed VT-3 of the top guide – no relevant indications.
		EVT-1	Performed EVT-1 at Grid Locations 42-27, 42-23, 22-43, 22-03, 02-23, and 02-19 – no relevant indications.
	2014	VT-1	Performed VT-1 of the Latches at 226° location – no relevant indications. Performed VT-1 of the contour wedges and fillet welds at 90° and 270°. Was not able to obtain 100% coverage of the contour wedges and fillet welds due to the fuel bundle being in the way. Will re-schedule exams for 2016.
	2016	VT-1	Performed VT-1 of the contour wedges and fillet welds at 90° and 270° and verified that alignment blocks in place. Previous indications identified in 2010 have not changed. An additional shallow indication was found on a contour wedge

			and on an alignment block. Will schedule exams for 2018.
Core Plate (Rim, etc.)	1995	VT-3	Verified 25% core plate bolts were in place.
	1998	VT-3	Verified 20% core plate bolts.
	1999	VT-3	Examined Fuel support castings in nine cells, no indications.
	2001	VT-3	Verified rim hold down bolts 1-54 Examined Fuel support castings in ten cells, no indications.
	2003	VT-3	Examined Fuel support castings in five cells, no indications.
	2005	VT-3	Examined Fuel support castings in twenty cells, no indications.
	2007	VT-3	Performed a general VT-3 of Fuel Support Casting in eight locations – no indications.
	2009	VT-3	Performed a VT-3 examination of Fuel Support Castings in 12 locations – no indications.
	2012	VT-3	Performed VT-3 on 12 of 54 core plate bolts – no indications
	2014	VT-3	Performed VT-3 on 14 of 54 core plate bolts – no indications.
SLC	1993	PT	Liquid Penetrant examination of the nozzle-safeend weld.
	2001	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2003	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2005	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld.

	2007	UT	Performed Appendix VIII UT of the Nozzle-Safeend Weld – no indications.
	2016	UT	Performed Appendix VIII Automated Phased Array UT of the Nozzle-Safeend Weld – no indications.
Jet Pump Assembly	96 (sample every RFO)	VT-3	Inspection of the riser spt pads (SIL551), holddown beams (SIL330), sensing lines (SIL420), three point contact (RICSIL078). Will inspect Riser Elbow in 1998. Repair to the set screws have been completed.
	1998	MVT-1	50% of total number of jet pumps, 100% of each inspected – no indications. All hold down beams – no indications.
	1999	UT EVT-1	DF-1 on JPs 1, 2, 3, 4, 13, 14, 15, 16, IN-4, MX-2 and WD-1 on JPs 3, 4, 13, and 14, RB-1 and RB-2 on JPs 3, 4, 13 and 14. This completes all exams on 8 of 16 JPs.
	2001	EVT-1	RB-1, RB-2, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, on JPs 7 and 8. No indications.
	2003	EVT-1	RB-1, RB-2, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, and 10. RS-1, RS-2, RS-3, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, 10, 11, 12. DF-1 on JPs 5, 6, 7, 8, 9, and 10. No indications. All hold down beams - no indications.
	2007	UT	Performed UT of all 16 Jet Pump. Holddown beams using GE technique – no indications.

	2007	EVT-1	AD-1 on JPs 15,16 AD-2 on JPs 15, 16 DF-1 on JPs 11, 12, 15, 16 DF-2 on JPs 15, 16 IN-4 on JPs 11, 12, 15, 16 MX-2 on JPs 11, 12, 15, 16 RB-1 on JPs 1, 2, 11, 12, 15, 16 RB-2 on JPs 1, 2, 11, 12, 15, 16 Riser Brace Pad on JPs 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16 RS-1, RS-2, RS-3 @ 324° location RS-6 on JPs 11, 15 RS-7 on JPs 12, 16 RS-8, RS-9 @ 252°, 324° locations
		VT-1	WD-1 on all 16 JPs No indications noted from any of the visual examinations.
	2009	EVT-1	DF-2 on JPs 1, 2, 3, 4, 13, 14 AD-1 on JPs 1, 2, 3, 4, 13, 14 AD-2 on JPs 1, 2, 3, 4, 13, 14 RS-1, RS-2, RS-3, TS-1A @ 36°, 72°, 288°
		VT-3	Sensing Line Clamp on JPs 1, 2, 3, 14 Sensing Line Support on JPs 4, 5, 12, 13 Sensing Line Exits at 90° and 270° No indications noted from any of the visual examinations.
	2010	EVT-1	RB-1, RB-2 on JPs 5, 6, 7, 8 RS-6, RS-7 on JPs 5, 6, 7, 8 RS-8, RS-9 on all JPs IN-4, MX-2 on JPs 5, 6, 7, 8 DF-1, DF-2 on JPs 5, 6, 7, 8 AD-1, AD-2 on JPs 5, 6, 7, 8 RS-1, RS-2, RS-3, TS-1A @ 108°, 144°
		VT-3	Sensing Line Clamp on JPs 6, 7, 8 Sensing Line Support on JPs 6, 7, 8 No relevant indications, indications on sensing line clamps were determined to be the result of initial installation.
	2012	EVT-1	DF-1, DF-2 on JPs 13, 14, 15, 16 AD-1, AD-2 on JPs 13, 14, 15, 16 RS-1, RS-2, RS-3, TS-1A @ 288°, 324°

	2014	EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 3 (at 64°), and 4 (at 80°) - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JPs 9 (208°) and 10 (224°) – no relevant indications.
	2016	UT	Performed UT of all 16 Jet Pump. Holddown beams using WesDyne technique – no indications.
		EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 11 and 12 - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JP 11 and standoff on JP 12– no relevant indications.
CRD Guide Tube & Stub Tube	95 (every 10 years)	VT-3	Inspected accessible portions of three guide tubes and three stub tubes, no indication were detected.
	2003	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2005	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2007	VT-3	Performed general VT-3 examination of eight locations – no indications.
Dry Tube	88 (6 cycles and then every three cycles)	VT-1 (1 mil wire)	Inspected in 1988 with indications reported, replaced with the new design.
	1999	VT-3	Inspected accessible portions of 11 dry tubes, no indications noted.

	2007	VT-1	Performed VT-1 of upper 24" of five dry tubes. Note the exam was performed on the accessible areas – no indications.
	2009	VT-1 VT-3	Performed examination on four dry tubes. Note the exam was performed on the accessible areas – no indications.
	2010	VT-1	Performed examination on six dry tubes. Note the exam was performed on the accessible areas – no indications.
	2014	VT-1	Performed VT-1 on five (5) dry tubes. Note the exam was performed on the accessible areas – no indications.
	2016	VT-1	Performed VT-1 on two (2) dry tubes. Note the exam was performed on the accessible areas – no indications.
Instrument Penetration			
Vessel ID Brackets	Every 10 years	VT1(active fuel) VT-3 all others	Per ASME Section XI.
LPCI Coupling	N/A	N/A	Not applicable to DAEC.
Top Head	1998	VT-3	No indications.
	1999	VT-3	No indications.
	2003	VT-3	No indications.
	2005	VT-3	No indications.
	2007	VT-3	Performed VT-3 of interior portion of the RPV Head – no indications.
Guide Rod	1998	VT-3	No indications.
	1999	VT-3	Both examined (found cracked tack weld on 0 degree rod which was evaluated as acceptable).
	2001	VT-3	Inspected 0 degree guide rod, no additional indications.

	2003	VT-3	Inspected 180 degree guide rod, no indications.
	2007	VT-3	Inspected 180 degree guide rod, bracket, and bracket welds – no indications.
	2009	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
	2016	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
Sample Holder Integral Attachments	1998	VT-1 VT-3	No indications.
	1999	VT-1 VT-3	108 and 288 degree examined with no indications.
	2001	VT-1 VT-3	108 degree examined with no indications.
	2003	VT-1 VT-3	36 and 108 degree examined with no indications.
	2005	VT-1 VT-3	288 degree examined with no indications.
	2007	VT-3	108° location – no indications.
	2009	VT-3	288° location – no indications.
	2012	VT-3	All upper brackets – no indications.
	2014	VT-1	All lower brackets – no indications.
Core Spray Piping & Sparger Brackets	1998	VT-3	No indications.
	2001	VT-3	No indications.
	2005	VT-3	No indications.
	2009	EVT-1	Performed EVT-1 on the Piping Brackets at 30°, 150°, 210°, and 330° - no indications.

		VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2012	VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2014	VT-1	Performed VT-1 on the Sparger Bracket at 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2016	EVT-1 & VT-3	Performed EVT-1 on the Piping Bracket attachment welds and VT-3 of the attachment hardware at 30°, 150°, 210°, and 330° locations – no indications.
Jet Pump Riser Support Pad	1998	VT-1	No indications.
	2003	VT-1	216 degree pad – no indications.
	2005	VT-1	144 and 252 degree pads – no indications.
	2014	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 3 (at 64°), and 4 (at 80°) – no indications.
	2016	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 11 and 12 – no indications.
Feedwater Spargers	1998	VT-1 VT-3	Indications around flow holes.
	2001	VT-1 VT-3	No additional indications.
	2005	VT-1 VT-3	No additional indications.
	2007	VT-1	Detailed inspection of all four spargers at the following locations due to broken keeper: Vessel Attachment Keeper to pin Handle interface Keeper to Sparger Bracket weld Pin to sparger bracket Pin to wall bracket

			Sparger Bracket & Bolts Sparger Bracket to Vessel Measurement Sparger to End Plate Jacking Bolts (two spargers only) T-Box to Sparger Welds Wear was noted in several locations. (details can be provided if requested).
	2009	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications
		EVT-1/ VT-3	Performed EVT-1/VT-3 of Bracket Welds at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no indications Implemented a FW Sparger Modification to repair the indications noted in 2007. This modification was to re-install the preload on the spargers @ 225° and 315°.
		VT-1	Performed VT-1 on FW Brackets @ 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - wear was identified on the 264° 276°, and 354°.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2012	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.
		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2016	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.

		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
Steam Dryer	2003	VT-1/3	Inspect per GE SIL644. Indications in Upper Support Ring, Drain Channels, and Access Openings- all indications evaluated "use as is".
	2005	VT-1/3	Inspect per GE SIL644 Rev 1. Indications in Drain Channels and Upper Support Ring – all indications evaluated "use-as-is". No change in previous indications.
	2007	VT-1	Inspected per BWRVIP-139 (all exterior locations) Indications in Drain Channels, Access Openings and Upper Support Ring. All indications evaluated "use-as-is" for one cycle. Some of the previous indications could not be located and some new indication were identified. (Details can be provided if requested.)
	2009	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). All previously identified indications were noted as "No change". Three new indications were identified. 1) Upper Guide Bracket was observed to have a rolled piece of metal extending out and below the face/corner of the guide channel. 2) Middle weld on Tie Bar #4 was found cracked, and 3) Lower guide bracket, 180° side was found bent. All indications were determined to be acceptable.
	2010	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). Two previously identified indications were noted as NRI, all others were "No change". Three new indications were identified on access hole

			cover. All indications were determined to be acceptable. Repairs made to Tie bars 3, 4, and 7 and to the rolled metal on the upper guide found during previous outage.
	2012	N/A	No inspections
	2014	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
	2016	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
Dissimilar Metal Weld	2009	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on four (4) Category C, seven (7) Category D and two (2) Category E dissimilar metal welds.
	2010	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on ten (10) Category C, fifteen (15) Category D and two (2) Category E dissimilar metal welds. One category C weld had relevant indications. This was repaired by a weld overlay during the outage.
	2012	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on one (1) Category C dissimilar metal weld – no indications.
	2014	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on three (3) Category C and four (4) Category D dissimilar metal welds – no indications.

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.
	Fall 2016 RF20	UT	Examined 100% accessible regions of H-3, 4, 5, 7. Found 5 indications in H4, all less than 3 inches length, less than 17% thru wall, 1.93% of examined length. Found 1 indication in upper side H5, 5.96 inches in length, depth 15%, 1.39% of examined length. Examined portions of H4 and H7 for off-axis indications in accordance with VIP interim guidance. 2 minor indications identified on H4, both less than 2 inches in length, depth less than 15% thru wall. Re-inspection scheduled for 10 years in accordance with BWRVIP-76 and VIP interim guidance.
Shroud Support	Spring 1994 RF06	VT-3	Examined 6 shroud support pillars 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 RF16	VT-3	Examined annulus surface. No issues or FME found.
	Spring 2012 RF17	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	Examined annulus surface, FOSAR, recovered 5 Powerfect nuts.
		EVT-1	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.
	Spring 2015 RF19	EVT-1	Examined flat access hole cover. No indications.
		EVT-1	Examined top hat access hole cover. Examined 77.78% circumferentially of vertical weld, 24.2% has signs of indications.
	Fall 2016 RF20	VT-3	Examined annulus surface. No issues or FME found.
		VT-3	Examined annulus surface. No issues found. Identified FME removed from the vessel.
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	Examined all creviced and non-creviced weld locations, no indications

		VT-1	Examined all (8) header brackets, no new indications.
	Spring 1999 RF08	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no new indications.
	Spring 2000 RF09	EVT-1	Examined all creviced weld locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Fall 2001 RF10	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Spring 2003 RF11	EVT-1	Examined all creviced weld locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2004 RF12	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2006 RF13	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2007 RF14	UT & EVT-1	Examined all creviced and 100% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2009 RF15	EVT-1	Examined all locations that could not be UT examined in the previous outage, no indications.
		EVT-1 & VT-3	Examined 25% header brackets. No indications.
	Fall 2010 RF16	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.

	Spring 2012 RF17	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.
	Spring 2015 RF19	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
	Fall 2016 RF20	EVT-1 EVT-1 & VT-3	Examined 'B' loop piping elbows (P4a-d), 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 RF16	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 RF16	EVT-1	Examined 4 top guide grid beam locations. No indications.
	Spring 2012 RF17	EVT-1	Examined 2 top guide grid beam locations. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 top guide grid beam locations. No indications. SRM plunger tip was not fully seated but was reseated into the receptacle.
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	50% riser braces (RB-1/2 & RS-8/9), 100% RS-1, no indications

		VT-1	100% sensing lines. Three pumps have cracked standoffs, installed clamps.
		VT-3	100% beams, no indications
		VT-3	100% wedges and setscrews. 1 screw with 1 tack cracked
	Spring 1999 RF08	EVT-1	50% riser brace(RB-1/2 & RS-8/9), no indications
		EVT-1	100% RS-1, no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% beams, 100% wedges and setscrews, no indications
	Spring 2000 RF09	EVT-1	50% riser brace (RB-1/2 & RS-8/9), no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% wedges and setscrews, no indications
	Fall 2001 RF10	VT-1	100% sensing lines, no indications
		VT-3	100% wedges
	Spring 2003 RF11	VT-1	100% wedges, no movement noted
		EVT-1	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
		VT-1	50% sensing lines, no indications
	Fall 2004 RF12	UT	100% beams, BB1/2, no indications
		VT-1	50% sensing lines, no indications
		EVT-1	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	50% sensing lines, no indications
		VT-1	100% wedges, one had minor wedge wear, installed slip joint clamp
		EVT-1	25% RB-1/2, 25% RS-8/9, no indications
	Fall 2007 RF14	VT-1	100% wedges, one had minor wedge wear and SS setscrew gap of 35 mil, installed auxiliary wedge
		VT-1	1 slip joint clamp, no issues
		VT-1	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 VT-3 VT-1 VT-3 EVT-1	100% wedges, no wear found. Slip joint clamp and aux wedge. No issues found. 11 sensing lines. No indications. Installed aux wedge for an issue found previous outage. 50% RS3, no indications.
	Fall 2010 RF16	EVT-1 VT-1 VT-3	100% RS-8/9 and 25% RS-6/7. No indications 50% wedges. No new wear found. 3 sensing line clamps and 1 aux wedge. No issue found.
	Spring 2012 R17	EVT-1& VT-1 VT-1 EVT-1	25% inlet/mixer and diffuser welds (IN4, MX2, DF1/2, AD1/2). No issues found. 3 riser brace welds. No issues found. 50% wedges. No new wear found. 3 RS-1 and RS-2. No issues found.
	Fall 2013 RF18	UT VT-1 VT-1	100% beams, no indications 3 sensing line lower bracket, no indications 6 known setscrews tack cracks. 3 confirmed no growth, 3 no indication.
	Spring 2015 RF19	VT-1 VT-1 VT-3 VT-3 VT-3 EVT-1 EVT-1 & VT-1	50% wedges and rods. No new wear found. 14 sensing line support brackets. No indications. 3 sensing line clamps. No indications. 1 Slip joint clamp. No indications. 2 Aux wedges. No indications. 50% RS-3 Riser to Transition. No indications. 2 Riser Braces, RB-1 & RB-2. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 restrainer bracket to riser pipe welds, RS-6 and RS-7, and 3 riser brace to riser pipe welds, RS-8 and RS-9, no indications.

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 VT-3	Below Core Plate Inspection Examined 100% of CRGT-2 & CRGT-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	VT-1	Examined IAW SIL 409. No indications found.
	Spring 1999 RF08	EVT-1	All 12 dry tubes had circumferential cracking approx 1 inch below the upper collar
	Spring 2000 RF09		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	VT-1	50% jet pump riser bracket, no indications
	Fall 1997 RF07	VT-1 VT-3	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

	Spring 1999 RF08	VT-1	25% core spray header bracket, 100% feedwater sparger bracket, 100% steam dryer support bracket, no indications.
		EVT-1	50% jet pump riser bracket, no indications
		VT-3	100% guide rod bracket, no indications
	Spring 2000 RF09	VT-1	25% core spray header bracket, no indications
		EVT-1	50% jet pump riser bracket, no indications
	Fall 2001 RF10	VT-1	25% core spray header bracket, no indications
		VT-3	100% guide rods, no indications
	Spring 2003 RF11	EVT-1	25% core spray header bracket, no indications
	Fall 2004 RF12	EVT-1	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 EVT-1 & VT-1	25% core spray header brackets. 100% feedwater brackets. Found minor pin wear on 2 pins. Evaluation justified operation for one cycle.
	Fall 2010 RF16	EVT-1 VT-1	25% core spray header brackets. 2 Feedwater bracket pins where wear previously found. No discernable change.
	Spring 2012 RF17	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 VT-1 VT-3	25% core spray header brackets and 4 jet pump riser braces. No issues found. Examined 120deg surveillance capsule assembly.
	Spring 2015 RF19	EVT-1 & VT-1	2 jet pump riser brace arm. No indications.
		EVT-1 & VT-3	25% core spray header brackets.
		EVT-1 & VT-3	100% steam dryer support bracket to RPV. No indications.
		VT-3	2 guide rod flange & brackets. No indications.
		VT-3	100% feedwater sparger vessel attachments. No indications.
		VT-3	2 Feedwater bracket pins where wear previously found. No additional wear.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
LPCI Coupling	Fall 2001 RF10	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2003 RF11	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2006 RF13	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2012 RF17	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2015 RF19	EVT-1 VT-1 VT-3	Examined 50% couplings. Two indications on the shroud attachment ring, ~.88" & 1".

		EVT-1	Expanded scope to include same location on balance of couplings. No indications.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
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	100% drain channels, one indication identified on skirt below a seismic lug access plate weld, 0.75"
		VT-1	100% support ring, no new indications, no growth on previous indication
	Spring 2003 RF11	VT-1	100% support ring, no new indications, no growth on previous indication
		EVT-1	Re-look at skirt indication, no growth
		EVT-1	Manway cover plate
		VT-1	100% cover plates
		VT-3	100% tie bars
		VT-1	100% lifting lug braces, one found severed.
	Fall 2004 RF12	VT-1	100% support ring, no growth on previous indication, new indication identified; 0.625" across top, and 0.75" down face.
		VT-1	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	Previously identified indications on support ring, no growth found.
		VT-1	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 crater crack found on a lifting rod bracket weld. All indications were evaluated for use as is. No repairs required.
	Fall 2010 RF16	VT-1	2nd re-baseline IAW BWRVIP-139 following EPU 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 RF17	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.
	Spring 2015 RF19	EVT-1 & VT-3	100% Support bracket to RPV. No indications.
		VT-1	Examined known flaw for growth. No growth observed.
	Fall 2016 RF20	VT-1	Examined 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 RF16	UT	Examined 5 category C welds after weld crown reduction; 2 by auto, 3 by manual. No indications found.
	Spring 2012 RF17	UT	Examined 1 category E weld by manual UT.
	Fall 2013 RF18	A-UT	Examined 3 category C welds with automated UT. No growth of known embedded flaws, no new indications.
	Fall 2016 RF20	A-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)
	Spring 2015 RF19	VT-3	Examined eight shroud head bolts, including pin area. No indications.
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.
Capsule	Spring 1994 Spring 2015 RF19		Removed 30 degree capsule. Removed 120 degree capsule per EPRI ISP program.

Reactor Internals Inspection History

Plant: **Oyster Creek Generating Station**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Steam Dryer	Fall 2016	Visual	VT-1 of all high stress (red) locations and 10% of green locations. A total of 81 locations were inspected. EVT-1 of all 4 Hold Down Assemblies and all 4 Dryer Lifting Rods. Re-inspected previous Steam Dryer indications and repair areas. Evaluated indication areas with no change and areas with minor change as acceptable as is. New indications on tie bars TB-F measured 1.3" and TB-I ~ ¼". Indications on drain channels welds V07 ID &V15 ID and Jacking Bolt at 50 degrees are new or showing growth or changes from the previous examinations. These indications are acceptable until 2020 which is after plant shutdown.
	Fall 2014	Visual	Re-inspected 2 Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2012	Visual	Re-inspected Steam Dryer indications and repair areas, including indications on the ID, identified during previous outages. Evaluated indication areas with no change and areas with minor change to use-as-is for one cycle.
	Fall 2010	Visual	Re-inspected Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2008	Visual	Completed BWRVIP-139 required inspections of the ID of the dryer using GEH Firefly ROV. Identified 2 areas of fatigue cracking in drain channels and 1 area of fatigue cracking in support beam to mid-support ring weld.

			Evaluated as use-as-is for one cycle in accordance with BWRVIP-139 generic flaw evaluation. Re-inspected Steam Dryer indications and repair areas identified during previous outages. Tie bar N-1 lower repair area was found degraded and GEH issued JCO for one cycle of operation.
	Fall 2006	Visual	Re-inspect Steam Dryer Indications identified during previous outages. EVT-1 cracks in hold-down area from 1R19. VT-1 all 4 lifting lugs and EVT-1 indications on 135 deg. lug. BWRVIP-139 required inspections (top side) completed. New fatigue indications were identified that required repair. Dryer repair project completed with 2 areas stop drilled and one crack in center baffle plate was cut out.
Core Shroud	Fall 2016	VT-3	VT-3 of Tie-Rods at 10 deg and 70 deg. No findings Re-inspection of two horizontal indications on vertical weld V-9. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. No changes in the end points from 2006. These conditions are acceptable for ten years.
	Fall 2014	VT-3	VT-3 of 5 Tie-Rods at 100, 130, 160, 280 and 350 deg. locations. No findings.
	Fall 2012	VT-3	VT-3 of 3 Tie-Rods at 170, 220 and 310 deg. Locations. No findings.

	Fall 2010	VT-3	VT-3 of 2 Tie-Rods at 10 and 70 deg. Locations (#2 and #8). No findings.
	Fall 2008	UT / EVT-1	UT / EVT-1 inspection completed for all 10 shroud vertical welds. One indication found with UT in V10 weld – 1.76 inches long with depth of 0.47 inches. A technical evaluation was completed to use-as-is.
		VT-3	VT-3 Tie-Rods at 100 deg, 130 deg, 160 deg, 280 deg, and 350 deg. No findings.
	Fall 2006	EVT-1	V-9 inspection of ID and OD. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. A technical evaluation was completed to use-as-is.
			VT-3 Tie-Rods at 170 deg, 220 deg and 310 deg. No findings. VT-1 of Upper Bracket to Shroud Ledge interface on all 10 Tie Rods. No findings.
	Fall 2004	None	No Examinations Required.
	Fall 2002	None	No Examinations Required.
	Fall 2000	EVT-1	V-3, V-4, V-15 and V-16. This was a one sided exam from the OD. No findings.
	Fall 1998	UT EVT-1	V-7, V-8, V-10 and V-12. V-11 I.D. Seven tie-rod assemblies baseline inspected.
			V-10 exhibited minor OD cracking away from the heat-affected zone. This cracking is believed to be associated with handling lugs that were welded during construction and removed after installation. All other inspected vertical welds were found free of indications. With the inspections

			performed in 16R and 17R, all accessible vertical welds in the shroud core region are complete. The following vertical welds could not be located. V-3, V-4, V-15 and V-16.
	Fall 1996	Visual	Inspected per BWRVIP-07. Three of ten tie rods inspected, no change from installation. EVT-1, OD of V-9 and V-11, (120" total). V-9 exhibited 3 small axial cracks in HAZ on the OD totaling 1.75". The ID of V-9 was free of axial cracks. A number of small transverse cracks were found on the OD and ID of V-9. V-11 was free of any indications. Analysis showed structural margin maintained.
	Fall 1994	Ultrasonic and visual	Inspected per BWRVIP-01 and 03. Cracks were detected in the Shroud welds H2, H4, H6A, and H6B. Lack of fusion was detected in H3 weld and visual cracks on the ID surface. The Tie Rod modification was installed. Base line visual performed of the tie rods.
Shroud Support	Fall 2016	EVT-1	EVT-1 of (2) of the 36 Lug / Clevis pin assemblies - #02 and #08. No findings.
	Fall 2014	Visual	EVT-1 of 5 of the 36 Lug / Clevis pin assemblies - #11, #14, #17, #29 and #36. No findings.
	Fall 2012	UT, EVT-1, VT-3	EVT-1 of 11 of the 36 Lug / Clevis pin assemblies - #5, #6, #12, #13, #18, #22, #23, #25, #31, #32 and #35. No findings. UT of H-9 from the OD (Drywell). Inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found "no change" in the 4" long indication in the N1E nozzle area. No other findings. VT-3 of 360 deg. (100%) of top of H9 weld. No findings.

	Fall 2010	Visual	EVT-1 of 6 of the 36 Lug / Clevis pin assemblies - #1, #2, #7, #8, #20 and #21. No findings.
	Fall 2008	Visual	EVT-1 of 8 Lug / Clevis pin assemblies - #10, #11, #14, #15, #17, #29, #30, and #36. No findings.
	Fall 2006	Visual	EVT-1 of 7 Lug / Clevis pin assemblies - #1, #18, #19, #23, #24, #32 and #33.
	Fall 2004	None	No examinations required.
	Fall 2002	UT	30% UT of H-9 from the OD (Drywell). UT inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found one 4" long indication in the N1E nozzle area. This "service induced" indication is in the bottom side of the H9 weld and does not penetrate into the base metal of the RPV.
	Fall 2000	Visual	25% of H-9, cleaning performed and EVT-1 inspection completed. This completes 100% inspection of the H-9 weld. No findings.
	Fall 1998	Visual	25% of H-9, cleaning performed and enhanced VT-1, no findings
	Fall 1996	Visual	25% of H-9, (different area then the 1994 inspection), cleaning performed and enhanced VT-1, no findings.
	Fall 1994	Visual	25% of H-9 cleaning performed and enchanted VT-1, no findings.
Core Spray Piping	Fall 2016	Visual	EVT-1 of all 10 annulus piping fillet welds. No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD,

			P4gD, P4hD, P3aB, P3bB and P4dB. No findings.
	Fall 2014	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings.
	Fall 2012	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 16.5 deg. No findings. EVT-1 of 25% sample butt welds: P4dA, P4eA, P4fA, P4iA, P4bB, P4cB, P4eB, P4fB, P4gB, and P4hB. No findings.
	Fall 2010	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 285 deg. No findings. EVT-1 of 25% sample butt welds: P4aA, P4g/aA, P3aC, P3bC, P4dC, P4eC, P4fC, P4aB, P3aD, and P3bD. No findings.
	Fall 2008	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD, P4gD, P4hD, P3aB, P3bB, and P4dB. No findings.
	Fall 2006	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 103.5 deg. No findings.

			EVT-1 of 25% sample butt welds: P4bA, P4cA, P2A, P4g/aA, P4g/bA, P4hA, P4iC, P4g/aC, P4g/bC, P4hC, P4bB, P4eB, P4fB, P4gB and P4hB. No findings.
	Fall 2004	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L-3, L-3A, L-4, L-20A, L-13A, L-5, L-7, L-8, L-10, L-11, and L-12 • U-3, U-3A, U-4, U-15A, U-24A, U-7, U-8, U-9, U-10, U-11, U-12, U-16, and U-17 100% of annulus pipe brackets at 15°, 105°, 195° and 285°. No findings. EVT-1 of all creviced welds in the annulus piping = U3, U3A, U4, U15A + U24A; L3, L3A, L4, L13A + L20A.
	Fall 2002	Visual	EVT-1 of a 25% sample (11 welds) of the butt welds (non-creviced) not inspected in 17R or 18R: • U1,U15,U17,U18,U19,U20 • L1,L9,L13,L16,L20 Inspect 100% of annulus pipe brackets (15°, 105°, 195° and 285°) No Findings.
	Fall 2000	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L3, L3A, L4, L6, L13A, L14, L15 and L20A • U3, U3A, U4, U7, U8 and U15A 100% of annulus pipe brackets 15°, 105° 195° and 285°. No findings.

	Fall 1998	Visual	All creviced welds in the annulus piping; sample (25%) of the non-creviced welds in the annulus piping: • L2, L9, L10, L11, L12, L13, L17, L18, L19 and L20 • U2, U5, U6, U13, U14, U15, U21, U22, U23 and U24 Sample (25%) of pipe brackets 285°, 195°
	Fall 1996	Visual	Inspected per BWRVIP- 03. Cleaning of all accessible weld/HAZ surface and performed enhanced VT-1. No findings.
	Fall 1994	Visual and air test	Inspected VT-1, (1 mil wire). No change to pinhole weld defect detected in slip joint in 1992. Note: Pinhole weld defect detected in 1992 in System I. Analysis showed structural margin maintained
Core Spray Sparger	Fall 2016	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings except some rolled material noted on the CS SB 271 deg at the middle bracket sparger B contact point. This wear is not in a weld or HAZ of a weld. Inspected all ten sparger repair clamps. No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings.

	Fall 2014	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C & D. No findings. VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2012	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings. Inspected all 10 sparger repair clamps. No findings.
	Fall 2010	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C and D (CASS). No findings.

			VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2008	Visual	EVT-1 Sparger Pipe End Cap welds: S4A – 60 deg., S4A – 240 deg., S4B – 60 deg., S4B – 240 deg. No findings. EVT-1 "T" box welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-C. No findings. VT-1 of 50% of the sparger bracket welds – SB – 055, 065, 150, 208, 235, 271 and 330 deg. No findings.
	Fall 2006	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 60 deg., S4C - 240 deg., S4D - 60 deg., and S4D - 240 deg. No findings. EVT-1 "T" box welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-B. No findings. VT-1 of 50% of the sparger bracket welds – SB – 026, 091, 120, 179, 240, 300, and 359 deg. No findings.
	Fall 2004	Visual	Inspected all sparger repair clamps. No findings. Inspected end cap welds S4A-60, S4A-240, S4B-60, and S4B-240. No findings. Inspected sparger brackets SB-055, 065, 150, 208, 235, 271 and 330. No findings
	Fall 2002	Visual and Air Test	VT-1 all spargers, nozzles, end cap welds and repair clamps. No findings. No new leaks were identified during the Air Test.

	Fall 2000	Visual and Air Test	All sparger end cap welds were cleaned and EVT-1 inspected. No findings. VT-1 of spargers, repair clamps, and nozzles. No findings. No new leaks were identified during the Air Test.
	Fall 1998	Visual and Air Test	All sparger repair clamps, both spargers.
	Fall 1996	Visual and air test	Inspected per BWRVIP-03. Cleaned end cap welds and performed enhanced VT-1. No findings. Tee box welds are clamped and not accessible to clean or visual. Performed VT-1, (1 mil wire), of sparger piping and nozzles. No findings.
	Fall 1994	Visual and Air Test	Performed VT-1, (1 mil wire) of sparger piping and nozzles. No findings.
	1978 - 1980	Visual	(2) Cracks in sparger piping. Repair clamps installed. Note: Cracking found in sparger in 1978; repaired with clamps. Sparger has been inspected and air tested every outage since then; report submitted to NRC for approval for restart every outage.
Top Guide	Fall 2016	Visual	EVT-1 of previous top guide grid beams indications. The largest indication was measured from cell 43-44 at 3.875". Three indications that were measured in 2010 had longer lengths in the 2016 examination (slight growth less than an inch). The indications are acceptable as is for 4 years. VT-1 of two Hold Down Bolts (33 and 213 deg). No findings.
	Fall 2014	None	No inspection required this outage.
	Fall 2012	Visual	VT-1 of 2 hold-down bolts at 123 deg. and 303 deg. No findings.

	Fall 2010	Visual	EVT-1 Inspection and Measurement of 3 Cracks in Grid Beams (#4, VT-3 & VT-6). Some crack growth was observed. Flaw evaluation completed to support use as is. BWRVIP-183: Inspect 5% = 7 cells. No findings.
	Fall 2008	None	Not required for this outage by analysis.
	Fall 2006	Visual	EVT-1 of selected known flaws in grid beams: #4, VT-3 and VT-6. One area showed no growth, while the other two had grown between 0.25" and 0.75" from the 2002 outage to the 2006 outage. A flaw evaluation was performed to use-as-is.
	Fall 2004	Visual	VT-1 of top guide hold down bolts at 303 and 123 degrees. No findings. EVT-1 of VT-6 crack showed no measurable growth. Could not visually locate two other existing UT indications.
	Fall 2002	Visual	EVT-1 of two existing cracks measured in 18R outage (#3 and #5). No change to crack length identified.
	Fall 2000	Visual	Top guide hold down bolt assembly VT-3 at 33° and 213°. Top guide beam to rim fillet welds VT-1 at 33° and 213°. No findings. VT-1 of two existing cracks (#3 and #5) with cleaning. Both cracks measured on both sides. Crack #5 showed approx. 1" growth. Crack #3 showed no measurable growth.
	Fall 1998	None	Not required for this outage by analysis.
	Fall 1996	Ultrasonic 100% grid beams	12 indications emanating from notches detected at intersections of cross members. 5 of the 6 cracks on bottom

			side of member at mid-span detected. Removed sample from beam with crack to investigate root case.
	Fall 1994	Visual	[Under side of Top Guide] Three additional vertical cracks were detected at mid-span locations. Disposition use as is.
	Fall 1992	Visual	[Under side of Top Guide] Two additional vertical cracks were detected at mid-span location. Disposition use as is.
	Fall 1991	Visual	[Under side of Top Guide] A vertical crack was detected at mid-span location. Disposition use as is.
Core Plate	Fall 2016	None	No exams were required.
	Fall 2014	None	No exams were required.
	Fall 2012	None	No exams were required.
	Fall 2010	Visual	VT-1 inspected 3 In-core guide tube plugs 28-45, 44-13 and 44-21. No findings.
	Fall 2008	Visual	Visually inspected core plate wedges at 96° and 276° azimuths. No findings.
	Fall 2006	None	No exams were required.
	Fall 2004	Visual	No wedge inspections required. Inspected in-core guide tube plugs 04-29, 20-37, and 12-21. No findings.
	Fall 2002	Visual	No inspections needed. Wedges replace hold down bolt inspections.
	Fall 2000	Visual	Visually inspected all 8 wedges to verify integrity after first cycle of operation. All wedges found as installed.
	Fall 1998	Visual	Wedges installed. No further exams of core plate were performed.

	Fall 1996	Visual	Inspected top portion only of 18 hold down bolt that were not inspected in fall 1994 and top periphery section at bolt locations. No findings.
	Fall 1994	Visual	Inspected 18 hold down bolt tops only and top periphery at bolt locations inspected. No findings.
Jet Pump Assembly	N/A	N/A	N/A
Jet Pump Diffuser	N/A	N/A	N/A
SLC	Fall 2016	UT	UT examined the N12 liquid poison nozzle DM weld. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	PT	PT of Liquid Poison Nozzle to Safe End Weld. No findings.
	Fall 2010	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2008	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2006	UT	PDI - UT the Liquid Poison Nozzle N12 / SE. No findings.
	Fall 2004	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2002	Visual / PT	PT of Liquid Poison Nozzle – No Indications. Inspect insulated nozzle from drywell during RPV pressure test. No leakage observed.
	Fall 2000	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 1998	VT-2 during Code pressure test.	Not made accessible for direct exam.
	Fall 1996	None	Not made accessible.

	Fall 1994	None	Not made accessible.
CRD Guide Tube	Fall 2016	None	Not required and not made accessible.
	Fall 2014	None	Not required and not made accessible.
	Fall 2012	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 1 guide tube base for CASS (VT-1). No findings
	Fall 2010	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 2 guide tube bases for CASS (VT-1). No findings.
	Fall 2008	None	Not required and not made accessible.
	Fall 2006	EVT-1, VT-3	Inspected 4 guide tubes. No findings.
	Fall 2004	EVT-1, VT-3	Inspected 4 guide tubes. No Findings.
	Fall 2002	EVT-1, VT-3	Inspect 1 guide tube (46-43) removed to support stub tube inspection. No findings.
	Fall 2000	VT-1, VT-3	2 guide tubes. No findings.
	Fall 1998	VT-3	15, no findings.
	Fall 1996	No inspection Performed.	Not made accessible.
	Fall 1994	No Inspection Performed	Not made accessible.
CRD Stub Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.
	Fall 2010	None	No inspections required.
	Fall 2008	None	No inspections required.
	Fall 2006	None	No inspections required.
	Fall 2004	None	No inspections required.

	Fall 2002	VT-1	Visual Inspection of 2 stub tubes found leaking at bottom head in Fall 2000 (42-43 and 46-39). No indications noted.
	Fall 2000	VT-1 VT-2 pressure test	None made accessible. 2 stub tubes found leaking at bottom head (42-43 and 46-39). Performed UT of CRD housing to stub tube welds (J weld) and area of housing to be rolled. No indications. Roll repaired both leaking housings.
	Fall 1998 Fall 1996 Fall 1994	No inspection Performed.	Not made accessible.
In-Core Housing	Fall 2016	None	Not made accessible.
	Fall 2014	None	Not made accessible.
	Fall 2012	None	Not made accessible.
	Fall 2010	None	Not made accessible.
	Fall 2008	None	Not made accessible.
	Fall 2006	None	Not made accessible.
	Fall 2004	None	Not made accessible.
	Fall 2002	None	Not made accessible.
	Fall 2000	None	Not made accessible.
	Fall 1998 Fall 1996 Fall 1994	No inspection performed.	Not made accessible.
Dry Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.

	Fall 2010	Replacement	Replaced final 4 Dry tubes due to service life: IRM-15 and 16; SRM 22 and 23.
	Fall 2008	Replacement	Replaced 4 Dry tubes due to service life: IRM-12, 13, 14 and SRM-21.
	Fall 2006	Replacement	Replaced 4 Dry tubes due to service life: IRM-11, 17, 18 and SRM-24.
	Fall 2004	Visual	VT-1 of SRM 24 found tube not fully engaged in top guide. VT-1 of IRM 17 and IRM 18 found both tubes bowed.
	Fall 2002	Visual	No inspections required.
	Fall 2000	Visual	VT-1 five dry tubes. One found slightly bent – use as is. No findings on others.
	Fall 1998	Visual	VT-1 one dry tube, no findings
	Fall 1996	Visual	VT-1 one dry tube, no findings.
	Fall 1994	Visual	VT-1 four dry tubes, no findings.
Instrument Penetrations	Fall 2016 Fall 2014 Fall 2012 Fall 2010 Fall 2008 Fall 2006 Fall 2004 Fall 2002 Fall 2000 Fall 1998 Fall 1996 Fall 1994	Visual	VT-2 exam from vessel exterior. No findings.
Vessel ID Brackets	Fall 2016	VT-3	VT-3 of 2 guide rod wall brackets. No findings. VT-3 of 6 surveillance specimen brackets @ 30, 210 and 300 deg. No findings. VT-3 / VT-1 of all 4 Spargers and Nozzle Interface Areas. No changes in the indications for spargers at 45 and 135 deg.

	Fall 2014	EVT-1	Inspected all 4 dryer support brackets. Minor changes in wear patterns were evaluated for continued service.
	Fall 2012	None	No inspection required.
	Fall 2010	EVT-1	EVT-1 all feedwater sparger attachment wall bracket welds. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	EVT-1	EVT-1 both Guide Rod Brackets. EVT-1 all 3 Surveillance specimen brackets. No findings.
	Fall 2004	EVT-1	Inspected all 4 dryer support brackets. No findings.
	Fall 2002	EVT-1	All feedwater sparger attachment brackets. Both guide rod attachment brackets. All surveillance sample brackets (30, 210 and 300 degree locations) No indications on attachment welds.
	Fall 2000	EVT-1	All 4 dryer support brackets. Observed wear indications on brackets. No indications on attachment welds. All feedwater attachment brackets inspected. No indications on attachment welds. Cracks observed on feedwater sparger to end bracket welds (non-safety-related component) on 2 ends.
	Fall 1998 Fall 1996 Fall 1994	VT-1	VT-1 of accessible portions of weld on guide rod brackets, steam dryer brackets, surveillance sample brackets. All attachment welds; no findings.
LPCI Coupling	N/A	N/A	N/A
Fuel Support Casting	Fall 2016	Visual	VT-1 Inspection of 1 Fuel Support Casting Cell 26-47. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	Visual	VT-1 Inspection of 1 Fuel Support Casting. No findings.

	Fall 2010	Visual	VT-1 inspection of 2 CRGT Bases (support castings) for CASS program. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	None	None inspected.
	Fall 2004	None	None inspected.
	Fall 2002	None	None inspected.
	Fall 2000	Visual	VT-3 (2) support casting. No findings.
	Fall 1998	Visual	VT-3 (24) support castings. No findings.
	Fall 1996	Visual	VT-3 (25) support castings. No findings.
	Fall 1994	Visual	VT-3 (17) support castings. No finding
Reactor DM Welds (BWRVIP-75-A)	Fall 2014	UT - Auto	UT examined eight (8) dissimilar metal (DM) welds containing alloy 82/182. This included three (3) DM welds on the top head. No new findings identified.
	Fall 2012	UT - Auto	UT examined three (3) Category D nozzle to flange dissimilar metal (DM) welds containing alloy 82/182. No findings. UT examined one (1) Category C recirculation suction nozzle to safe end DM weld N1A. Found no change to previously identified flaw and updated the flaw evaluation for another 2 cycles.
	Fall 2010	UT - Auto	UT examined four (4) Category C nozzle to safe end dissimilar metal (DM) welds containing alloy 82/182. No findings.

	Fall 2008	UT – Auto	UT examined five (5) Category C nozzle to safe end dissimilar metal (DM) welds. One indication identified in N1A recirculation suction nozzle to safe end weld dispositioned as acceptable for 2 cycles in accordance with IWB-3600 flaw evaluation. The 0.21 inch ID connected indication was in the RPV nozzle to clad interface on the Reactor side of the Alloy 182 DM weld. The flaw evaluation was submitted to the NRC.

Note: All indications left "as is" were analyzed and structural margins were acceptable for continued service.

Reactor Internals Inspection History

Plant: **Peach Bottom Atomic Power Station, Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1994	UT & VT	Comprehensive UT Baseline of some Category "C" circumferential welds (H-2, H-3, H-4, and H-5) per BWRVIP-01, Rev. 0. Partial UT baseline of welds H-1, H-6, and H-7, w/ partial Enhanced VT-1 of H-6 OD. 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-6, and OD of H-4 and H-5. Full structural margins calculated using two cycles of crack growth for comprehensively examined welds, one cycle for welds with limited exams. No indications identified on H-2 and H-7.
	1996	UT	Comprehensive UT of welds H-1, H-6 and H-7 per BWRVIP-01, Rev. 1. Exams per BWRVIP-03. Indications identified on ID of welds H-1, H-6 and H-7, on OD of weld H-1. Full structural margins calculated using two cycles of crack growth. Reexaminations planned per BWRVIP-76
	2002	UT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76. Indications identified on each weld. UT of Vertical welds V-1 through V-4. No indications identified. Reexaminations scheduled per BWRVIP-76.
	2012	UT & VT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76, Rev. 1. Indications were identified on all horizontal welds. Horizontal welds H1, H2, H3 and H4

			were evaluated and found acceptable for continued service via a plant specific analysis performed by SIA. Horizontal welds H5, H6 and H7 were evaluated via Table 2-1 of BWRVIP-76. UT of vertical welds V-1 through V-8 were performed with one indication identified on the V-3 weld. The indication was determined to be acceptable for continued service. EVT-1 examinations were performed on the following: shroud ID of the H-4 weld at 045 degrees, the shroud ID intersection of the V-5 and H-4 welds at 090 degrees, shroud ID intersection of the V-6 and H-4 welds at 270 degrees. No indications were identified during the visual inspection of the core shroud.
Shroud Support	1992	VT-3	VT-3 examination of support leg stub welds. No indications identified. VT-3 examination of welds H-7, H-8, and shroud support cylinder. No indications identified.
	1994	VT-3	VT-3 of accessible portions of H-8 weld between Jet Pump #1 and #10. No indications identified.
		VT-1	VT-1 examination around perimeter of 0 deg. access hole cover. No indications identified.
		UT	UT examination of both access hole covers. No indications identified.
	1998	EVT-1	EVT-1 examination of both AHCs. No indications identified. EVT-1 of 10% of shroud support weld H-8, top side, no indications identified. EVT-1 of 10% of shroud support weld H-9, top side, no indications identified.
	2000	EVT-1	EVT-1 examination of both AHCs. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 0° and 180° Azimuth. No indications identified.

	2002	UT	UT of 10% of H-9 weld length from OD of vessel. No indications identified.
	2004	EVT-1	EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 180° and 360°. No indications identified
	2008	EVT-1	EVT-1 examination of both AHCs. No indications identified.
	2010	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		UT	BWRVIP-180 baseline UT exams were completed on both AHCs. No indications identified.
	2012	EVT-1	EVT-1 of the H-9 weld was performed on the 157.5°-202.5° and the 337.5°-022.5° degree segments of the weld. No indications were identified. Note: Examination coverage of the H-9 weld was greater than 10% of the weld.
	2016	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of 10% of shroud support weld H-8, the 157.5 -202.5 deg and 337.5-022.5 deg segments of the weld. No indications identified.
Core Spray Piping	1980 to 1996	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.
	1996	VT-1 (1/2 mil)	EVT-1 (1/2 mil resolution) performed on annulus piping welds per BWRVIP-18. Cracking identified in "B" Header tee-box cover plate weld (P2B). UT performed to characterize indication.

			Evaluation demonstrated structural margin for one operating cycle
	1998	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique. EVT-1 used to supplement UT. No new indications identified. P2B weld reexamination yielded additional margin.
	2000	EVT-1	EVT-1 of nine (9) piping welds not previously UT'd, and of six (6) pipe brackets and attachment welds. No indications identified.
	2002	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (28 welds). EVT-1 used to supplement UT (6 welds). EVT-1 on two (2) support brackets. No new indications identified. P2B weld indication reexamination revealed minimal growth.
	2004	EVT-1	EVT-1 of twelve (12) piping welds not accessible for UT inspection. No indications identified
	2006	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). EVT-1 used to supplement all one-sided UT (12 welds). EVT-1 only on eight (8) pipe welds and six (6) support brackets. P2B weld indication reexamination revealed no growth. New 9/16" indication identified visually at intersection of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.
	2008	EVT-1	Re-inspection per BWRVIP-18, EVT-1 used on (21) pipe welds. P2B weld indication re-examination revealed no growth. The P3B1 9/16" indication revealed no growth. New indication (0.49") identified visually on the upper side of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.

	2010	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). Two sided UT performed on selected P4 elbow welds. EVT-1 used to supplement all one-sided UT on T-box welds (8 welds). P2B weld indication reexamination revealed no growth. P3B1 indications identified some change in measured size due to better cleaning and exam video resolution. . Structural and leakage evaluations found flaw acceptable for continued service.
	2012	EVT-1	EVT-1 examination of 17 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2014	EVT-1	EVT-1 examination of 33 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2016	EVT-1	EVT-1 examination of (7) pipe welds. The examinations re-identified indications on the P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for one cycle. All other examinations identified no indications.
Core Spray Sparger	1980 to 1994	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13, Cracking discovered at tee-box to sparger pipe weld ("B" Sparger, 1982), bolted repair clamp installed. No other indications identified.
	1998	VT-3 & MVT-1	Reinspections per BWRVIP-18, no indications identified.
	2000	EVT-1	EVT-1 of selected sparger welds per BWRVIP-18. No indications identified.

		VT-1	VT-1 of sparger tee-box repair clamp, and approx. 50% of sparger "C" and "D" nozzles and drains. VT-1 of eleven (11) sparger brackets and welds. No indications identified.
	2002	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of seven (7) sparger pipe welds. No indications identified.
	2004	VT-1, EVT-1	VT-1 of six (6) Sparger support bracket welds, one (1) sparger drain, and 50% of nozzles on spargers "C" and "D". EVT-1 of fifteen (15) Sparger pipe welds. No indications identified.
	2006	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2008	EVT-1, VT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. EVT-1 of ten (10) sparger pipe welds. No indications identified.
	2010	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2012	VT-1, EVT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. One recordable indication was identified on sparger bracket 04. The indication was defined as deformation on the top, middle and lower brackets. The deformation was concluded to be minor and would not impact the ability of the bracket to support the sparger piping. EVT-1 of six (6) sparger pipe welds identified no indications.

	2014	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
Top Guide (Rim, etc.)	1976 to 1994	VT-3	VT-3 exam every other refueling outage per Section XI. No indications identified.
	1987	UT	UT examination performed of specific cells. No indications identified.
	1994	VT-3	Visual (VT-3) examination of 4 cells (48-41, 08-25, 24-17, and 24-25), per SIL 554. No indications identified.
	1996	VT-3	Visual (VT-3) of 2 aligner pins (0 deg. And 270 deg.), per SIL 588. No indications identified.
	2012	EVT-1	EVT-1 examinations were performed on nineteen (19) top guide cells in accordance with BWRVIP-183. No indications were identified.
Core Plate (Rim, etc.)	1996	VT-3	VT-3 examination of all accessible hold down bolts (cell 16-57, and area at 0 and 270 deg. Azimuth. No indications identified.
	2010	VT-3	VT-3 examination of 16 core plate plugs. No Indications identified.
	2012	VT-3	All 129 core plate plugs were replaced with the new design. VT-3 of nine (9) core plate bolts was performed. No indications were identified.
SLC	1992	PT	Surface (PT) examination of nozzle to safe end weld per Section XI. No indications identified.
	1998	PT & UT	PT and UT of N10 nozzle to safe-end, no indications identified.
	2002	PT	Extended dwell time Liquid Penetrant examination of entire safe end.

			No indications identified.
	2006	PT	Extended dwell time Liquid Penetrant examination of entire safe end. No indications identified
	2010	UT-E	SLC Nozzle to safe end weld. No indications identified.
Jet Pump Assembly	1976–1996	VT-3	Visual VT-3 of all jet pump components performed every other refueling outage.
	1981	VT & UT	VT and UT examination performed on all 20 hold down beams. No indications identified.
	1994	VT	Restrainer bracket wedge misalignment and wear identified on several wedges. Evaluations found condition acceptable without repair. One restrainer bracket set screw tack weld found cracked. Evaluations found condition acceptable without repair.
	1996	VT	Restrainer bracket wedge conditions and set screw tack welds remain unchanged, condition acceptable without repair.
	1998	MVT-1	MVT-1 of: RS-1 weld on all 10 risers, RS-2 & RS-3 welds on 6 of 10 risers. No indications identified.
		UT	UT of all 20 hold down beams. No indications identified.
	2000	EVT-1	EVT-1 of adjusting screw tack weld (jet pump 7) and RS-2 & RS-3 on 5 of 10 risers. No indications identified.
	2002	EVT-1	EVT-1 of fifty (50) Medium priority weld locations. EVT-1 of transition region of two (2) hold down beams. No indications identified
	2004	EVT-1	EVT-1 of forty one (41) medium priority welds, to complete 50% baseline inspections. No indications identified.

		UT	UT performed on all twenty (20) hold down beams (3 zones, BB-1, BB-2, and BB-3). No indications identified.
		VT-1	VT-1 on all twenty (20) Inlet Mixer main wedges. Thirteen (13) jet pumps exhibited additional wear at main wedge-to-restrainer bracket interface. Performed expanded scope of inspections on these jet pumps. Set screw gaps identified at five (5) jet pumps. No additional problems identified. Installed eight (8) slip joint clamps and three (3) set screw auxiliary spring wedges, to mitigate wear believed to be caused by vibration.
	2006	VT-1, EVT-1, VT-3	VT-1 of twenty (20) WD-1 locations. EVT-1 of five (5) IN-4 welds, and two (2) riser braces-to-vessel attachment welds. VT-3 of eight (8) Slip Joint Clamps and three (3) Auxiliary Spring Wedges. Expanded EVT-1 scope on three (3) jet pumps due to WD-1 findings.
	2008	UT	UT exams performed on all 20 jet pump hold down beams. No indications identified.
		VT-3	Visual inspections performed on 5 auxiliary spring wedges installed. No indications identified.
		EVT-1	EVT-1 of 50 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Expanded EVT-1 scope on one jet pump due to WD-1 findings.
		VT-1	VT-1 of twenty (20) WD-1 locations. Re-examined previously identified wedge wear with no apparent changes noted on 19 of 20 inspections. One main wedge had additional wear into the restrainer

			bracket. BWRVIP 41 expanded scope inspections were performed with no additional indications identified. One Slip joint clamp was installed on the affected Jet Pump.
	2010	VT-3	VT-3 of two slip joint clamps. No indications identified
		VT-1	VT-1 of all twenty (2) JP main wedges. No new/additional wear identified. VT-1 of all JP set screws for gaps. Minor gaps identified on seven JPs. Five (5) accepted for continued service by engineering analysis. Two (2) were corrected by tapping down on the main wedge.
		EVT-1	EVT-1 of 37 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Completed BWRVIP Letter 2009-202 required inspections.
	2012	VT-3	VT-3 of seven slip joint clamps. Minor wear detected on JP 15 slip joint clamp. Wear was acceptable for continued use and will be re-inspected next outage.
		VT-1	VT-1 of all twenty (20) JP main wedges. New wedge wear identified on JP 16 and accepted for continued use. New wedge rod wear identified and accepted for continued use on JPs 1, 2, 5, 10, 11, 12, 14, 17 and 20. VT-1 of three (3) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. VT-1 of set screw gaps were performed on seven (7) JPs. Five of the jet pumps had minor gaps which were acceptable for continued use by an engineering analysis.

		EVT-1	EVT-1 of 20 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser pipe to transition piece weld, riser brace leaf to RPV Pad Weld, riser pipe to restrainer bracket circumferential weld and the bottom of the nozzle casting to the top of the mixer assembly weld (IN-4). No indications identified.
	2014	VT-3	VT-3 of nine (9) slip joint clamps. Minor wear detected on JP 05 and JP 15 slip joint clamps. Wear was acceptable for continued use and will be re-inspected next outage. New slip joint clamps were installed on JP 16 and JP 20 as a result of new wear on the belly band, and restrainer bracket.
		VT-1	VT-1 of all twenty (20) JP main wedges. Slight new wedge wear identified on JP 16 and accepted for continued use. The wedges on the bottom side on JPs 13 and 16 appeared to be lower. New wedge rod wear identified and accepted for continued use on JPs 06, 13 and 20.
		VT-1	VT-1 of eight (8) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. The auxiliary wedges on JPs 10 and 18 were found in the over-travel and were replaced. The aux. wedge on JP20 was also found in the over-travel position and a slip join clamp was installed which resulted in no set screw gaps. Both aux wedges on the shroud side and vessel side on JP 20 were then removed.
		VT-1	VT-1 of set screw gaps were performed on jet pumps without a slip joint clamp or auxiliary wedge. All as-left gaps were acceptable for continued use and none exceeded the 0.010" criteria for installation of an auxiliary wedge.

	2016	VT-1	VT-1 of four (4) slip joint clamps. Minor wear detected on JP 05 SJC. Wear was acceptable for continued use.
		VT-1	VT-1 of (20) main wedges. New wedge rod wear identified on JP 03, 13 and 16 and accepted for continued use. The wedges on JPs 12, 14 and 20 appeared to be lowered.
		VT-3	VT-3 of three auxiliary wedges. Minor wear identified on JP 13 and 18 aux wedges and accepted for continued use.
		EVT-1	EVT-1 of 28 medium and high priority welds including riser pipe to riser brace welds, riser elbow to thermal sleeve, inlet and mixer connections, riser elbow to riser pipe welds etc. A 1 5/8" flaw was noted on JP11/12 RS-1 weld and was accepted as is with re-inspection next outage in 2018.
Jet Pump Diffuser	1998	MVT-1	MVT-1 of: AD-1 & AD-2 welds on 12 of 20 pumps, AD-3A & B welds on 11 of 20 pumps, and DF-2 weld on 10 of 20 pumps. No indications identified.
	2000	EVT-1	EVT-1 of AD-1, -2, -3a, -3b, and DF-2 on jet pumps 1 through 10. No indications identified.
	2002	EVT-1	EVT-1 of ten (10) High priority weld locations. No indications identified.
	2004	EVT-1	EVT-1 of eleven (11) medium priority weld locations, to complete 50% baseline inspections. No indications identified
	2006	UT	UT of ninety eight (98) Diffuser / Adapter welds and six (6) Inlet Mixer welds. One 2" indication found on DF-2 weld, JP 17. Structural and leakage evaluations found indication acceptable for continued service.

	2010	EVT-1	EVT-1 of JP 17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified.
	2012	EVT-1	EVT-1 of JP-17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified. This examination was a recommendation from the 2012 BWRVIP INPO review visit.
	2016	EVT-1	EVT-1 of (60) Diffuser / Adapter welds. Indications were identified on (11) Jet Pumps out of 20 AD-3a/b backing ring. Largest indication on JP03 ~3.6 inches. Indications were acceptable as is with re-inspection next outage.
		EVT-1	EVT-1 of JP-17 DF-2 weld from the OD to look for any visual indication of the flaw identified by UT in 2006. 40% coverage of the OD was achieved, all suspect areas were investigated and no indication was identified.
CRD Guide Tube	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified
	2002	EVT-1, VT-3	EVT-1 of three (3) welds on each of ten (10) Guide Tubes (locations 50-31, 42-11, 42-23, 42-51, 38-27, 38-35, 38-51, 34-23, 34-39, and 30-31). Some flow interference with examinations. VT-3 equivalent of anti-rotation pin on ten (10) Guide Tube locations. No indications identified
	2006	EVT-1, VT-3	EVT-1 of fifteen (15) CRGT welds, VT-3 of five (5) CRGT welds, verification of seventeen (17) CRGT alignment pins. One slightly bent pin identified. Pin remains functional. Condition found acceptable. No other indications identified.

	2008	EVT-1	EVT-1 of nine (9) CRGT welds. No indication identified. Also, verification of eight (8) CRGT welds and (8) CRGT alignment pins.
	2010	EVT-1	EVT-1 of four (4) CRGT welds. No indications identified. All BWRVIP-47 baseline examinations have been completed.
CRD Stub Tube	1992	VT-3	VT-3 examination of stub tube welds accessible from fuel cells 26-31 and 30-27. No indications identified.
In-Core Housing	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
Dry Tube	1984		All Dry Tubes replaced in 1984
	1994	VT-1	VT-1 examination of IRM Dry Tube 2D, at core location 37-32.
	1997	N/A	All IRM and SRM tubes replaced w/ Wide Range Monitoring tubes in 1997. No inspections required.
	2016	N/A	The 1997 WRNM replacement left four dry tubes as spares, with no detector installed. All four spare dry tubes were replaced in 2016.
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.
LPCI Coupling			N/A for this plant
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 per ASME Section XI. No indications identified.
	2000	EVT-1	EVT-1 of six (6) Core Spray piping brackets. No indications identified.
	2002	EVT-1	EVT-1 of two (2) Core Spray piping brackets, two (2) Steam Dryer support

			brackets, and five (5) Jet Pump Riser brackets attachment welds. No indications identified.
	2004	EVT-1	EVT-1 of two (2) Steam Dryer support brackets and three (3) Jet Pump riser brace attachment welds.
		VT-3	VT-3 of four (4) Steam Dryer hold down brackets and three (3) lower surveillance brackets. No indications identified.
	2006	EVT-1, VT-3, VT-1	EVT-1 / VT-3 of twelve (12) Feedwater Sparger attachment bracket welds. EVT-1 / VT-1 of two (2) Jet Pump riser brace-to-vessel welds. No indications identified. Minor anomalies incidentally identified on several FW Sparger bracket pins.
	2008	VT-3	VT-3 of 5 Feedwater Sparger end brackets and attachment pins
		EVT-1	EVT-1 of 2 Core Spray bracket attachment welds
	2012	VT-3	VT-3 of 6 feedwater sparger end brackets and attachment pins. Wear identified on 5 of the 6 feedwater spargers end brackets and/or attachment pins. Wear was acceptable for continued use.
		EVT-1	EVT-1 of 8 Core Spray bracket attachment welds. No recordable indications. EVT-1 of 4 steam dryer support brackets. No recordable indications.
	2014	EVT-1, VT-1, VT-3	EVT-1/ VT-3 of four (4) Steam Dryer support brackets. New wear was observed at locations 094 and 274 deg and acceptable with engineering evaluation. Previously noted wear was observed on 004 and 184 deg with no changes. EVT-1 of four (4) Jet Pump Riser brackets attachment welds. No indications identified.

			VT-1 of three (3) lower surveillance brackets. No indications identified.
	2016	VT-3 EVT-1	EVT-1/ VT-3 of four Steam Dryer support brackets. New wear was observed at all locations and acceptable with engineering evaluation. The wear is consistent with the new footprint of the replacement dryer versus the OEM dryer, with the 40% increase in weight. EVT-1 of (3) Jet Pump Riser brackets attachment welds. No indications identified. EVT-1 of 2 Feedwater sparger end brackets and attachment pins. Wear identified was acceptable for continued use.
Steam Dryer	2002	VT-1, VT-3	VT-1 of all drain channel welds. VT-1 of upper and lower dryer bank tie bar welds and baffle plate welds. VT-3 of dryer bank end and top covers, and instrument tubing and supports. One (1) central bank upper tie bar severed, and one (1) instrument tube support-to-baffle plate broken. Broken tie bar and instrument tube removed from dryer. New, stiffer tie bars welded to central dryer banks.
	2004	VT-1	VT-1 of five (5) replaced central bank upper tie bars, ten (10) original bank upper tie bars, and outer bank hoods @ internal reinforcing plates and end plate welds, per SIL 644, Supp.1. No indications identified.
	2006	VT-1	Completed all remaining BWRVIP-139 recommended inspections on seventy four (74) locations. One small indication (7/16") identified at base of drain channel vertical weld. No other indications identified.

	2008	VT-1	Re-examined small indication (7/16") identified at base of drain channel vertical weld. No change noted. No other indications identified.
	2010	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A re-examination of (six) key high stress (red) locations and five (5) tie bars. No indications identified. Examination of all four (4) lifting lugs. Indications identified on anti-rotation tack welds. Accepted continued service by engineering evaluation.
	2012	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A examination of eight high stress (red) locations and seven (7) tie bars. No indications identified in high stress locations. Existing deformation was identified in two of the tie bars and was accepted for continued service by an engineering evaluation. Examination of all four (4) lifting rod assemblies identified existing indications on each lifting rod assembly. These indications were accepted for continue service by engineering evaluation.
	2014	Replace-ment	As part of the EPU License Amendment Request (LAR), Exelon PBAPS replaced the Original Equipment Manufacturer (OEM) steam dryer with a 3-ring octagonal (Nordic style) Westinghouse dryer.
	2016	VT-3	General VT-3 as found was performed on: - Top and sides (incl. outside of skirt) - underside of RSD (incl. inside of skirt) - W and U channel guides - hold down rods and lifting rods - outer, middle and inner hoods - and support ring.

		VT-1	VT-1 of (71) recommended locations by the manufacturer. Indications were identified at bottom of the hold down rods on construction/ non-structural welds for all (4) HDRs and evaluated as acceptable as is with no repair. The welds will be reinspected next outage in 2018. No other indications identified.
Steam Separator	2006	VT-1	VT-1 examinations performed on a sample of upper and lower shroud head bolt support ring gussets. 12 of 24 lower ring gussets revealed degradation. No indications on upper support ring gussets. Indications acceptable for continued service.
	2008	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. 5 of 12 lower ring gussets with previously identified degradation had further crack growth and 4 lower gussets had new indications not previously identified. No indications were observed on the upper support ring gussets. All Indications are acceptable for continued service.
	2010	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. Slight growth at one previously identified indication. New indication identified on six (6) gussets. All new indications were minor and acceptable for continued service. Wear identified on one (1) shroud head bolt pin/window. SHB was removed.
	2012	VT-1	VT-1 examinations were performed on all mid support ring gussets with new indications identified. These indications were acceptable for continued service based on an engineering evaluation. VT-1 examinations were performed on three shroud head bolts with indications identified on all three.

			VT-1 of four upper support ring gussets revealed no indications. VT-1 of all four lifting lug assemblies revealed existing indications on all four assemblies. These indications were acceptable for continued service as a result of an engineering evaluation.
	2014	VT-1	VT-1 examinations were performed on all (24) mid support ring gussets with (4) new indications identified. These indications were acceptable for continued service based on an engineering evaluation.
		VT-3	VT-3 examinations were performed on all (31) shroud head bolts with indications identified on (13) SHB. These indications were acceptable for continued service based on an engineering evaluation. Three (3) new SHB were installed as part of EPU.
		VT-1	VT-1 of four upper support ring gussets revealed no indications and VT-1 of all four lifting lug assemblies revealed previously identified indications on all four assemblies with no changes.
	2016	VT-3	VT-3 of (5) shroud head bolts.
		VT-3	VT-1 of (4) upper support ring gussets and (8) middle ring gussets revealed indications that were acceptable for continued service based on an engineering evaluation.
		VT-1	VT-1 of all four lifting lug assemblies revealed previously identified indications with no changes.
Dissimilar Metal Welds (BWRVIP-75-A)	2008	UT-E (E = encoded)	Performed Manual UT on three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was not ID connected and determined to be a fabrication flaw after comparison to

			construction radiographs. Indication was found acceptable, no further analysis or repairs required.
	2010	UT-E	Performed Manual UT of three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. No indications were identified.
	2012	UT-E	Performed Manual UT of six (6) IGSCC Category D welds. Three of these welds were dissimilar welds. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was evaluated per the requirements of Table IWB-3514-2 of ASME Section XI and was found to be acceptable.
	2014	UT-E	Performed Manual UT of one IGSCC Category D dissimilar weld, 3-I-19R (RPV, Nozzle N9 to Cap). No indications were identified.
	2016	UT-E	Performed Auto UT of (3) IGSCC Category D DM weld and Manual UT of one IGSCC Category A DM weld. No indications were identified.

BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Fall 2016 Outages

June 2017

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Reactor Internals Inspection History

Plant: **Browns Ferry Nuclear Plant: Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	2005	UT	Baseline: UT (two-sided) examination of H1, H2, H3, H4, H5, H6, H7 performed per BWRVIP-76. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 83.0% / 0.0% H1 / Lower / 82.1% / 2.1% H2 / Upper / 81.8% / 0.4% H2 / Lower / 88.7% / 0.0% H3 / Upper / 88.7% / 0.0% H3 / Lower / 79.2% / 5.1% H4 / Upper / 90.0% / 20.1% H4 / Lower / 89.6% / 2.6% H5 / Upper / 91.3% / 1.2% H5 / Lower / 91.3% / 0.0% H6 / Upper / 91.9% / 0.0% H6 / Lower / 91.9% / 11.2% H7 / Upper / 91.4% / 12.0% H7 / Lower / 78.0% / 0.0%
	2016	UT	Reinspection per BWRVIP-76, UT (two-sided) examination of H1-H7; Baseline per BWRVIP-76, UT examination of V3 and V4. Results as follows: Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 84.6% / 0.0% H1 / Lower / 87.8% / 1.2% H2 / Upper / 87.9% / 0.3% H2 / Lower / 87.0% / 0.0% H3 / Upper / 86.8% / 0.0% H3 / Lower / 86.9% / 5.8% H4 / Upper / 97.5% / 23.4% H4 / Lower / 98.3% / 4.8% H5 / Upper / 92.1% / 0.0% H5 / Lower / 92.7% / 0.0% H6 / Upper / 93.2% / 0.0% H6 / Lower / 100.0% / 4.2% H7 / Upper / 100.0% / 2.4% H7 / Lower / 100.0% / 0.0%

			V3 / CCW Side / 96.5% / 0.0% V3 / CW Side / 88.7% / 0.0% V4 / CCW Side / 87.8% / 0.0% V4 / CW Side / 87.7% / 0.0%
Shroud Support	2005	VT-1, VT-3	Access Hole Cover Welds at 0° and 180°: Replacement required prior to Unit 1 Restart - Both access hole covers replaced with bolted repair design per DCN 51193. VT-1 visual baseline exam performed to inspect nut to retainer tack welds only. VT-3 visual baseline exam performed to document the as-left condition of the AHCs. No relevant indications on either cover.
		EVT-1	Baseline inspection per BWRVIP-104 of the H8 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. No relevant indications.
		EVT-1, UT	Baseline inspection per BWRVIP-104 of the H9 weld from the upper side with greater than 10% coverage between Jet Pumps 1 to 20 and 10 to 11. The lower side was performed during the removal of the Access Hole Cover modification with approximately 10% total coverage around the AHC areas at 0 & 180 degrees. Also performed UT from the outside surface of the RPV obtained from access of the N1A and N1B (Recirculation outlet nozzles) windows. Achieved coverage was calculated to be 19%. No relevant indications.
		VT-3	Baseline inspection per BWRVIP-104 of the H10 and H12 welds at 0 and 180 degrees. These inspections were performed through the access hole cover openings during the repair. No relevant indications.
	2008	VT-3	VT-3 visual inspection of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and

			the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
	2012	EVT-1	Reinspection of Shroud Support weld H-8 (EVT-1) at 0° and 180° per BWRVIP-38. No reportable indications were found.
	2016	EVT-1	Reinspection of Shroud Support weld H-9 (EVT-1) per BWRVIP-104. No reportable indications were found. Visual inspection per BWRVIP-180 (VT-1 from the top surface) and vendor recommendation (VT-3) of replacement access hole covers at 0 and 180 degrees to confirm that the AHC is in place and the hardware has not changed appreciably from the installed condition. No relevant indications were observed.
Core Spray Piping	2001	UT	Baseline inspection per BWRVIP-18: UT of T-Box welds @ 120 (P2) and 240 degrees (P2, CP3). UT of elbow and sleeve welds for Downcomers A through D (P4a, P4b, P4c, P5, P6, and P7). No relevant indications.
	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations (T-Box welds @ 120 (P1, AP3, BP3) and 240 degrees (P1, DP3), Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees). EVT-1 visual examinations of elbow and sleeve welds for Downcomers A through D (P4d, P8a, P8b). No relevant indications.
	2008	EVT-1	Reinspection per BWRVIP-18-A: EVT-1 visual inspections of T-Box Welds (P1 (120° & 240°), AP3, BP3, DP3) and Downcomer Welds (AP4d, A-D8a, A-D8b); no relevant indications were observed.
	2010	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds

			@120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. UT of elbow and sleeve welds (P4a, P4b, P4c, P4d, P5, P6, P7, P8a, & P8b) performed for Downcomers A through D. Two indications (1.04" and 2.20") observed on weld P4a on A Downcomer on the pipe side of the weld. Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R9 (2012). Supplemental EVT-1 visual inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2012	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
	2014	UT, EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees); no relevant indications were observed. UT of elbow weld P4a performed for Downcomer A and elbow welds P4a, P4b, P4c, & P4d performed for Downcomer B. Two indications observed on Weld P4a on Downcomer A were resized (0.40" and 2.37") and two additional indications were identified (0.52" and 0.23"). Indications evaluated in accordance with the Core Spray Flaw Evaluation Handbook. Evaluation showed piping is acceptable as-is for one cycle. Piping will be reinspected during U1R11 (2016). UT of sleeve welds (P5, P6, P7, P8a, & P8b) performed for Downcomers A through D; no relevant indications were observed. Supplemental EVT-1 visual

			inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2016	EVT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3) degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)). No relevant indications were observed.
Core Spray Sparger	2005	EVT-1	Baseline inspection per BWRVIP-18: EVT-1 visual examinations of sparger welds (S1, S2, S4). BS2-R weld @ 9 degrees (Sparger to T-Box Weld, R side (Lower Sparger) recorded a crack adjacent to the weld and was structurally replaced by weld repair clamp per DCN 51193. AS2-R weld @ 354 degrees (Sparger to T-Box Weld, R side (Upper Sparger) recorded a pin hole adjacent to the weld and evaluated as "accept as is". Otherwise, no relevant indications.
		VT-1	Baseline inspection per BWRVIP-18: VT-1 visual examinations of sparger welds (S3a, S3b, S3c, Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees). No relevant indications.
	2008	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger welds (S1, S2, and S4) and VT-1 visual examinations of Sparger welds (S3a, S3b, and S3c) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2012	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-18, Rev. 1: EVT-1 visual examinations of Sparger A, C, D welds (S1 and S2 [L & R]), and Sparger A, B, C, D welds (S4 [L & R]) and VT-1 visual examinations of Sparger A, B welds (S3a, S3b, and S3c [L & R]) and Sparger Bracket (SB) welds @ 7, 45, 88, 93, 135, 172, 187, 225, 267, 273, 315, and 352 degrees); no relevant indications observed.
	2016	VT-3	VT-3 visual inspection of Core Spray Sparger BS-1/BS-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
Top Guide (Rim, etc.)	2005	VT-3	Baseline inspection (NON-BWRVIP): VT-3 visual examinations of Locations 4 (Grid Beam to Rim Top / Bottom Cover Plate Pins), 6 (Fuel Guard Weld and Bolting), 12 (Rim & Cover Plate Fabrication Weld), and 13 (Eye Bolt Boss). 1 area recorded as a condition on the plate (Location 12), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1	Baseline inspection (NON-BWRVIP): EVT-1 visual examinations of Locations 1 (Grid Beam & Beam to Beam Crevice Slot) and 10 (Rim Pins). 3 areas recorded as not acceptable (Location 1), evaluated as "accept as is". Otherwise, no relevant indications.
		EVT-1, VT-1	Baseline inspection per BWRVIP-26: Inspected Rim Welds (Location 11) (EVT-1) and Aligner Pins (Locations 2/3) (VT-1) at all locations. No relevant indications.
	2010	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
	2014	EVT-1	Baseline (2014) per BWRVIP-183: Location 1 (Grid Beam and Beam-to-Beam Crevice Slot) inspected for ten grid beam cells; no reportable indications.

	2014	EVT-1, VT-1	Reinspection per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no relevant indications.
Core Plate (Rim, etc.)	2005	EVT-1, VT-3	Baseline inspection per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were EVT-1 inspected from the top side, and seventeen (17) holddown bolts (50%) were inspected from the bottom side with no reportable indications. All one hundred twenty-nine (129) plugs (Location 13) were VT-3 inspected; three plugs were replaced.
	2008	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Three (3) core plate plugs replaced during Unit 1 Recovery were VT-3 examined to confirm that the replacement plug was in place. No evidence of movement, wear, or misalignment was visible.
	2010	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2012	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2014	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2016	VT-3	Reinspection per BWRVIP-25: All thirty four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
SLC	2007	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.

	2008	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
	2014	EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
		UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzle N10. No relevant indications reported.
		EVT-2	Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications were observed.
Jet Pump Assembly	2005	UT, VT-1	Baseline (2006) per BWRVIP-41, -138: UT of holddown beam locations BB-1, BB-2, and BB-3 (Jet Pumps 1 thru 20) - no reportable indications. Baseline (2005) per BWRVIP-41 of all High and Medium Priority Weld locations. Circumferential crack indication in backing ring for DF-3 weld (Jet Pump 19) will be inspected for change during U1C7 RFO in Nov. 2008.

			Baseline (2005) per BWRVIP-41: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); No wedge wear observed. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified nine (9) set screw gaps ranging from 12 to 35 mils in width. Two reportable linear indications identified on one of two set screw tack welds for Jet Pump Nos. 15 (shroud-side) and 16 (vessel-side). Nine (9) auxiliary wedges installed on Jet Pumps 2, 3, 4, 6, 7, 8, 10, 12, and 14.
	2008	VT-3	VT-3 visual examination of the holddown beam for Jet Pump #8 was performed in response to misalignment concerns raised during Unit 1 Recovery and an RFI identified during the October 2007 INPO BWRVIP Review Visit. There was a minor misalignment with the beam but no relevant indications were observed. VT-3 visual examination of sensing line clamps installed during Unit 1 Recovery on Jet Pumps 1-5 and 11-15 performed to confirm that all of the repair hardware is in place and that the hardware has not shifted or changed from the as-installed condition. No relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was previously recorded during Unit 1 Recovery and does not appear to have changed.
		VT-1	Reinspection per BWRVIP-41 R1: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted. Indication of vertical wedge movement at ten (10) locations was observed, but the movement markings did not appear to be recent and correlated

			with findings during the Unit 1 Recovery examinations. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified no new set screw gaps. Inspection results identified eight apparently new set screw tack weld indications in addition to the two set screw tack weld indications that were previously observed during Unit 1 Recovery. Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery were inspected to verify contact; no relevant indications were observed.
	2010	EVT-1	Reinspection per BWRVIP-41, Rev. 3: EVT-1 of Medium Priority Locations RS-8 and RS-9 (Jet Pumps 1 thru 20) performed in accordance with BWRVIP Letter No. 2009-202 ("Interim Guidance for Accelerated Inspections of Jet Pump Riser to Riser Brace Welds and Wedges"); no relevant indications.
		EVT-1	EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. This indication was unchanged from U1R7.
		VT-1	Reinspection per BWRVIP-41 R3: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted; three new instances of minor wedge wear since U1R7 noted at Jet Pumps 1, 6, and 10 determined to be the result of routing service during operation. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified one new set screw gap (Jet Pump 20: Shroud-Side Set Screw - 17 mils). Evaluation performed to provide one fuel cycle (U1C9) of continued operation.

			Inspection results identified two apparently new set screw tack weld indications on Jet Pump 17 in addition to the nine set screw tack weld indications that were previously observed during U1R7 (NOTE: An indication that was identified during U1R7 for Jet Pump 14 was accidentally counted twice). Justification for Continued Operation (JCO) was prepared and concluded that the jet pumps are acceptable as-is for one fuel cycle (U1C9).
	2012	UT, EVT-1, VT-1	Reinspection per BWRVIP-41 R3, -138 R1: UT of holddown beam locations BB-1 and BB-2, (Jet Pumps 1 thru 20) - no reportable indications. Reinspection per BWRVIP-41 R3: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, & RS-7 (Jet Pumps 1 thru 6); IN-4, MX-2, & DF-1 (Jet Pumps 1 thru 5); no reportable indications. EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, & AD-3b (Jet Pumps 1 thru 10); linear indication (0.5 inches long) observed in heat-affected zone above the AD-1 weld for Jet Pump 6 was evaluated using Jet Pump Flaw Evaluation Handbook and was deemed acceptable. Otherwise, no reportable indications. EVT-1 visual inspection performed of a circumferential crack indication in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indication had increased in length. An additional indication was observed when a stain was reclassified; both indications were unchanged from U1R8, however. VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on five jet pumps (Jet Pumps 1, 10, 12, 17, & 18);

			significant increase in wedge wear for Jet Pump 6 necessitated a repair (aux wedge installed on the Shroud-Side Set Screw (SS-SS) for Jet Pump 6 to stabilize the restrainer bracket assembly); RS-8 and RS-9 welds for Jet Pump 6 examined (EXPANDED SCOPE) to insure no degradation was present - no recordable indications.
	2012	VT-1	VT-1 performed of Set Screw Locations AS-1 and AS-2 for Jet Pumps 1 thru 20. Backlighting identified three (3) set screw gaps (1 existing and 2 new) one of which (SS-SS for Jet Pump 18) measured at 9 mils and the other two (Vessel-Side Set Screw) VS-SS for Jet Pump 17 & SS-SS for Jet Pump 20) each measured at 20 mils, which exceeded the 15-mil screening criteria for installation of an auxiliary spring wedge but did not exceed the 20-mil criteria above which the potential exists for high level jet pump vibration. Gaps were corrected by tapping down on main wedge, so no additional auxiliary wedges installed. 17 set screw tack weld indications (11 existing and 6 new) were identified during U1R9. SS-SS on Jet Pump 17 was found backed out to shroud wall due to tack weld failure. SS-SS was restored to its original position and repaired (staked and an aux wedge added). Four additional set screws (Jet Pump 11 VS-SS, Jet Pump 13 SS-SS, Jet Pump 15 SS-SS, and Jet Pump 16 VS-SS) were found to have both tack welds broken and were staked and an aux wedge added. Remaining set screws had only 1 of 2 set screw tack welds and were acceptable as-is.
	2014	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); minor wear/wedge movement on nine jet pumps (Jet Pumps 1, 6, 8, 9, 10, 12, 16, 17, & 18. Observed downward movement of the wedge for Jet Pumps 9

			& 12 led plant to conservatively inspect unrepaired adjusting set screws for both pumps – no reportable indications; minor wedge wear on all other jet pumps was unchanged. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Nine (9) auxiliary spring wedges installed during Unit 1 Recovery and six (6) auxiliary spring wedges installed during U1R9 (2012) were inspected to verify contact; no relevant indications were observed.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; indication was unchanged from U1R9 in 2012. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R9 in 2012.
	2016	VT-1	VT-1 performed of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); indications of minor wear on nine jet pumps (Jet Pumps 1, 2, 5, 6, 9, 10, 12, 16, & 17). Adjusting set screws (AS-1 and AS-2) for five jet of the pumps (1, 2, 6, 9, & 10) conservatively added to scope to ensure no vibration-related damage was occurring; no set screw gaps nor new tack weld cracking observed; no slip joint clamps were required to be installed.

			3gaps observed during last set screw gap inspection during U1R9 were reinspected (Jet Pump 17, VS-SS - no gap observed; Jet Pump 18, SS-SS - no gap observed; Jet Pump 20, SS-SS - 13-mil gap); no aux wedges were required to be installed. 7 set screws (Jet Pump 2 SS-SS, Jet Pump 12 SS-SS, Jet Pump 13 VS-SS, Jet Pump 15 VS-SS, Jet Pump 17 VS-SS, Jet Pump 18 SS-SS, & Jet Pump 19 SS-SS) with one tack weld cracked out of two were inspected; in all cases the previously uncracked tack weld was intact. Four (4) auxiliary spring wedges inspected as part of expanded scope had relevant indications, so all 15 aux wedges installed on Unit 1 were inspected. 14 of 15 wedges had minor wear but none was judged serious enough to prevent wedges from performing their design function.
		EVT-1	EVT-1 visual inspection performed of a linear indication (0.5 inches long) observed during U1R9 & U1R10 in heat-affected zone above High Priority Location AD-1 (Jet Pump #6) to determine if indication had increased in length; after cleaning the indication was re-identified as a scratch. EVT-1 visual inspection performed of circumferential crack indications in the backing ring for High Priority Location DF-3 (Jet Pump #19) to determine if the indications had increased in length; both indications were unchanged from U1R10 in 2014 and upon evaluation were determined to be acceptable for one fuel cycle.
Jet Pump Diffuser	N/A	N/A	Diffuser exams reported in above jet pump assembly inspection results.

CRD Guide Tube	2005	EVT-1, VT-3	Baseline per BWRVIP-47: 19 control rod guide tubes (10% of total) examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual examination of Locations CRGT-2 and CRGT-3; no reportable indications.
CRD Stub Tube	2005	VT-3	VT-3 examinations performed for accessible areas for 145 stub tubes at various core locations. No damage or distortion was noted.
In-Core Housing	N/A	N/A	N/A
Dry Tube	2006	VT	All twelve (12) SRM/IRM dry tubes replaced with modified design which is resistant to cracking. Inspections will be scheduled after dry tubes have reached the expected 20-year life (2027).
Instrument Penetrations	2007	VT-2	Visual leak check is performed during Unit Startup. No reportable indications reported.
	2008	VT-2	Visual leak check performed during Unit Startup. Leak observed in safe-end to pipe weld for N11B instrumentation nozzle was repaired with weld overlay.
	2010	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2012	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2014	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.

		VT-2	Visual leak check performed during Unit Startup. No relevant indications reported.
	2016	UT	Stainless steel safe end-to-pipe weld examined for Nozzles N11A, N12A, N12B, N16A, and N16B. No relevant indications reported.
			Visual leak check performed during Unit Startup. No relevant indications reported.
Feedwater Sparger	2005	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications.
			VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2008	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. No relevant indications were observed.
	2010	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor impact damage observed on 175° Bracket (acceptable as-is), but otherwise no relevant indications were observed (no pin wear).
	2012	VT-3	VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets and Retaining Pins. Minor wear observed under the retaining pin for the end bracket at one new location (55°) when compared to U1R8 (2010) inspection results. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R10 in 2014 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of

			any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R8.
	2014	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; no recordable indications.
		VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R11 in 2016 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R9 in 2012.
	2016	VT-3	VT-3 visual examination of Feedwater Sparger End Bracket and Retaining Pin at 55° location; minor wear under the Retaining Pin was unchanged. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U1R12 in 2018 will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Additionally, minor impact damage observed on 175° end bracket was unchanged from what was observed during U1R10 in 2014.
Vessel ID Brackets	2005	EVT-1	Jet Pump Riser Brace Welds (40) examined (EVT-1): No recordable indications.

			Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): Damage to upper right corner and an indication extending from the damaged corner of the dryer support bracket located at 274° was repaired during Unit Recovery. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications.
	2012	EVT-1	Jet Pump Riser Brace Welds (12, Jet Pumps 1-6) examined (EVT-1): No recordable indications.
	2014	EVT-1	Core Spray Piping Bracket Welds (8) examined (EVT-1): No recordable indications.
	2016	EVT-1	Jet Pump Riser Brace Welds (Jet Pumps 7-20) examined (EVT-1): No recordable indications. Steam Dryer Support Bracket Welds (4) examined (EVT-1): No recordable indications. Attachment weld at 184° only received a VT-3 examination due to heavy crud buildup and will be cleaned and inspected to the proper exam method during U1R12 in 2018. Feedwater Sparger Bracket Welds (12) examined (EVT-1): No recordable indications. Guide Rod RPV Attachment at 0°: Indication on tack weld at the upper guide bracket to the Guide rod observed during Section XI Code examination.
LPCI Coupling	N/A	N/A	Not applicable to this plant

Steam Dryer	2005	VT-1	Full baseline inspection performed in accordance with BWRVIP-139 and GE SIL 644 R1. Three Drain Channel Vertical Welds were found to have indications, and were repaired with weld overlays.
	2008	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were VT-1 visually examined and confirmed. No change in condition was noted from what was previously reported. General visual inspection (pre-EPU baseline) performed in accordance with BWRVIP-139 and GE SIL No. 644 R1; no relevant indications were observed.
	2008	VT-1	In preparation for ascension to EPU and operation at EPU conditions, various steam dryer modifications were performed. All thirteen (13) Steam Dryer Tie-Bars were replaced with a new design and three (3) additional steam dam gussets on each steam dam were added to the Steam Dryer. A visual (VT-1) inspection was performed to document the as-left condition.
	2010	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R7.
	2012	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R8. Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed

			condition; no relevant indications were observed.
	2014	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R9 (2012).
	2016	VT-1	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined (VT-1) and confirmed. No change in condition was noted from what was previously reported in U1R10 (2014). Post-installation inspection (VT-1) conducted for EPU-upgraded Tie-Bars that were installed during U1R7 to confirm that the hardware has not changed appreciably from the installed condition; no relevant indications were observed. Four (4) BWRVIP-139-A "Red Welds" (welds associated with dryer integrity) were visually inspected (VT-1). Three of the welds were found to have been removed during U1R7 modifications, the fourth had no relevant indications when examined.
Steam Separator	2010	VT-3	Steam Separator tie bars (cross bracing) examined for signs of cracking (Reference: INPO OE 30657). No relevant indications were observed on the cross bracing, but a minor dent was recorded at the top of a standpipe located in the southeast corner of the separator that was acceptable as-is.
DM Welds - BWRVIP-75-A Cat. C	2008	UT	3 welds inspected (RCRD-1-33, CS-1-002-008, CS-1-002-033A): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).

	2012	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R10).
	2016	N/A	No Cat. C DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R11).
DM Welds - BWRVIP-75-A Cat. D	2008	UT	2 welds inspected (DRHR-1-2, DRHR-1-11): PDI-qualified, automated exams. No flaws identified, no repairs.
	2010	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).
	2012	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 9 (U1R9).
	2014	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 10 (U1R10).
	2016	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 11 (U1R11).

Reactor Internals Inspection History

Plant: **Cooper Nuclear Station**

Component in BWRVIP Scope	Date of Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud	Fall 1995 (RE15)	UT	Baseline UT performed on welds H1 through H7 per BWRVIP guidelines. Indications identified in 4 circumferential welds. No examinations on vertical welds. No repair required.
	Spring 2005 (RE22)	UT	UT examinations were performed on welds H-1 through H-4 including a portion of vertical weld V16. Examination of welds H5-H7 was deferred to fall 2006. Single sided UT examinations were performed on welds H-1 through H-3 with welds H-4 and vertical weld (V-16) receiving dual sided examinations. Percentage of welds examined: H1 (54.9%), H2 (55.7%), H3 (63.9%), H4 (58.4%). The previously identified eight (8) flaws in H1 showed a net decrease in length. No new flaws in H2 were identified. The eight (8) flaws in H3 were reexamined with one (1) new flaw identified for a total increased change in flaw length relative to total weld length of 7.5 %. Two (2) new minor flaws were discovered in the HAZ of H4. In addition, a total of eleven (11) minor indications were identified in the base metal adjacent to H4. Six (6) of the indications exhibited characteristics associated with Stress Corrosion Cracking (SCC) in areas subjected to cold working during the shroud fabrication/installation process. The remaining five (5) indications did not exhibit characteristics of SCC but appeared to exhibit characteristics commonly observed from localized attachment removal sites. The indications were determined to be acceptable by analysis. No indications were observed in the vertical weld.

	Fall 2006 (RE23)	UT	UT examinations were performed on welds H5, H6a, H6b, and H7 using phased array. Two (2) sided examinations were performed on all welds except H7 that received a one-sided UT examination. Coverage was estimated at greater than 72% for welds H5, H6a, and H6b. H7 received greater than 53% coverage. A previously identified indication in H5 was re-examined with no apparent change. A previously identified indication in H6a was re-examined with no apparent change. A new minor indication was discovered in weld H6b in an area previously scanned in RE16 (1995). Two (2) new minor indications were discovered in weld H7, one in a previously scanned location and the other in an area not previously scanned.
		VT-3	VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Discovered an indication approximately ten (10) inches long behind JP-19. Analyzed as acceptable.
	Spring 2008 (RE24)	VT-3	Performed first ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Spring 2011 (RE26)	VT-3	Performed second ASME B-N-2 VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes in the indication.
	Fall 2014 (RE28)	UT	UT exams were performed on the H1 thru H7 welds along with the V16 and base material flaw behind JP19. The previously identified indications showed no apparent changes in growth and none were through wall.
			VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Also performed third ASME B-N-2 VT-3 successive examination of flaw

			discovered in base metal behind JP-19. No changes in the indication.
Shroud Support/ Access Hole Covers	1993-1995	VT-3 and UT	VT-3 examinations of welds on 50% of core plate each outage. No indications. UT of access hole covers (AHC) in 1993. No indications.
	Spring 1997 (RE17)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC in accordance with GE SIL 462. No indications.
	Fall 1998 (RE18)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 of AHC's in accordance with GE SIL 462. No indications. VT-1 of gusset plate welds between 0-180° to B-N-2.
	Spring 2000 (RE19)	VT-3	VT-3 examinations on 50% of the core shroud support plate. No indications.
		VT-1	VT-1 examinations of AHC's in accordance with GE SIL 462. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on 17% of the H8 and H9 welds. EVT-1 examinations on 6 gusset welds and AHC's. No indications.
		UT	UT examination of AHC's. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examinations on four (4) gusset welds. No indications.
	Spring 2005 (RE22)	UT	UT examinations on 11.7% of the H9 weld length. No indications
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations performed on approximately 16% of H8 weld length with no relevant indications. EVT-1 examinations of AHC per SIL462. No indications.

	Spring 2008 (RE24)	EVT-1	EVT-1 examinations performed on accessible lengths of welds on seven (7) gussets. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 examinations on 16.7% of the H8 weld. EVT-1 examinations on accessible lengths of welds on two (2) gussets @ 195° and 315°. No indications.
	Fall 2014 (RE28)	UT/EVT-1	UT performed on H9 with 13.4% coverage. EVT-1 performed on both AHC's. No indications.
Core Spray Piping	1980's to 1995	VT-1/VT-3	IEB 80-13 examinations of piping and welds in annulus. Three (3) indications identified in Fall 1995 outage by EVT-1. No repair required.
	Spring 1997 (RE17)	UT	UT examination of CS P8a and P8b welds. Indications on one P8a and P8b welds (first discovery). Evaluated as acceptable.
		EVT-1	EVT-1 examinations on balance of piping.
	Fall 1998 (RE18)	UT	UT examinations on the P8a and P8b indications were re-examined.
		EVT-1	Balance examined by EVT-1. No visual indications.
	Spring 2000 (RE19)	UT	UT examinations on P8a and P8b welds with indications. No repair required.
		EVT-1	EVT-1 of P3, P4, P5, P6, and P7 welds. No visual indications.
	Fall 2001(RE20)	UT	UT examinations on P3's, three (3) P4's, P5's, P6's, P7's, P8a's and P8b's. EVT examinations of thirty-one of the CS piping welds.
		EVT-1	EVT-1 examinations on fifteen (15) welds. Indications re-examined on P8a weld and P8b welds.
	Spring 2003 (RE21)	UT	UT examinations on all P8a and P8b welds. Identified three (3) flaw indications on one P8b weld and one (1)

			flaw indication on one P8a weld. No change in length.
		EVT-1	EVT-1 examinations on both junction box covers and accessible portions of both P1's, 2 - P2's, 4 - P3's, 1-P4a , 1-P4b, 1-P4c, 1-P4d. EVT-1 all P8a and P8b welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations of both P1's . The examination revealed that the P1 weld is not a creviced weld based on the presence of an external weld on the tee box near the nozzle thermal sleeve. EVT-1 examinations were performed on both P2 welds, the four (4) P3 welds, the 4a – 4d welds at 190° , the P5's, P6's, and P7's, the four (4) P8a's, and four (4) P8b's.
	Fall 2006 (RE23)	UT	UT examinations of P8b welds. Previous indications showed no change in size.
		EVT-1	EVT-1 examinations of piping welds and bracket attachment welds. No new relevant indications observed.
	Spring 2008 (RE24)	EVT-1	EVT-1 of indication near P1 at 90°. No change. EVT-1 of P1 at 270°. EVT-1 of P2's and P3's at 90° and 270°. EVT-1 of P4a, -b, -c, and -d at 170° EVT-1 of P5's, P6's, and P7's at 10°, 170°, 190°, and 350°.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations near P1welds at 90° and 270°. No change with the indication near the P1 at 90° (Loop A). EVT-1examinations of the four (4) P3, P5, P6 and P7 welds, EVT-1 examinations of downcomer welds P4a, P4b, P4c, and P4d at 10° . EVT-1 examinations of four (4) P8a and P8b welds. No change with visual indication of P8b at 10°.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.

	Spring 2011 (RE26)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° (Loop A). No change to the indication. EVT-1 of area adjacent to P1weld at 270°. No indications. EVT-1 of the P2 welds at 90° and 270°. EVT-1 of the four (4) P3, P5, P6, and P7 welds. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 190°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a, & P3b @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. No indications. EVT-1 of area adjacent to P1weld at 270° on B Loop,. No indications. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 350°. No indications. Loops A & B, EVT-1 of the bracket attachment welds PB @ 30°, 150°, 210°, and 330°. No indications.
		UT	UT performed on all four (4) P8a and P8b welds. Previously identified indications on the P8a at 190° (Loop B) and the P8b at 10° (Loop A) did not show any change.
	Fall 2014 (RE28)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of the P2, P3a & P3b welds @ 90°. EVT-1 of P5, P6, & P7 @ 10° & 170°. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d @ 170°. No indications observed.

			Loop B EVT-1 of area adjacent to P1weld at 270°. EVT-1 of the P2, P3a, & P3b welds at 270°. EVT-1 of P5, P6, and P7 welds @ 190° & 350°. No indications observed.
	Fall 2016 (RE29)	EVT-1	Loop A EVT-1 of area and indication adjacent to P1weld at 90° on A Loop. No change to the indication. EVT-1 of downcomer welds P4a, P4b, P4c, and P4d at 10°. No indications EVT-1 of two (2) P8a and two (2) P8b welds at 10° and 170°. No change with visual indication of P8b at 10°. Loop B EVT-1 of two (2) P8a and two (2) P8b welds at 190° and 350°. No indications.
Core Spray Sparger	1980's to 1995	VT-1/UT	IEB 80-13 of welds on sparger. No indications.
	Spring 1997 (RE17)	EVT-1	EVT-1 examinations of sparger welds and brackets per BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C identified. No other indications.
	Fall 1998 (RE18)	EVT-1	EVT-1 examinations of sparger welds and brackets inspected in accordance with BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C was reconfirmed. No other indications.
	Spring 2000 (RE19)	EVT-1	EVT-1 examinations of sparger and brackets. Five (5) indications evaluated as acceptable.
	Fall 2001 (RE20)	VT-1	VT-1 of 25% of S3a, S3b, and S3c welds. No indications.
		EVT-1	EVT-1 examinations of all S1, S2, and S4 welds examined with no indications.
	Spring 2003 (RE21)	VT-1	VT-1 of 25% of S3a & S3b's and all bracket welds. No indications.

		EVT-1	EVT-1 examinations of two S1,s, two S2,s, both XTRW welds near t-boxes, and four (4) S4 welds. No indications.
	Spring 2005 (RE22)	N/A	Sparger examinations deferred to fall 2006 (RE23).
	Fall 2006 (RE23)	VT-1	VT-1 on 50% of the S3a, S3b, and S3c welds and 100% on sparger brackets. No indications.
		EVT-1	EVT-1 on 100% of S1's and S2's and S4's. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 90°, 92°, 119°, 149°, 210°, 241° and 268°.
		EVT-1	EVT-1 examinations of S1's and S2's at 170° and 190°. EVT-1 examinations of S3a, S3b at 92° to 269°. EVT-1 examinations of S3c at 99°. EVT-1 examinations of S4's at 91° and 269°.
	Fall 2009 (RE25)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of SB's at 272°, 299°, 30°, 329°, 61°, 88° and 270°.
		EVT-1	EVT-1 examinations of S1 and S2 and at 10° and 350°. EVT-1 examinations of two (2) additional welds near the 350° tee-box S2 welds.
	Spring 2011 (RE26)	VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications.
		EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4 @ 91° & 269°. No indications. EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4@ 91° & 269°. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 on A sparger, S1 @ 10, S2 @ 8° & 12° and S4 @ 89° & 271°. No indications.

			EVT-1 on B sparger, S1 @ 350°, S2 @ 348° & 352°, XTRW welds near T-box @ 346° & 354°, and S4 @ 89° & 271°. No indications.
		VT-1	VT-1 on the B sparger, S3a & S3b @ 271°-89° and S3c @ 279°. No indications.
			VT-1 of the sparger brackets at 30.5°, 61°, 88°, 270°, 272°, 299°, and 329.5°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 on C Sparger, S1 @ 170°, S2 @ 168° & 172°, S4@ 91° & 269°. No indications observed.
			EVT-1 on D Sparger, S1 @ 190°, S2 @ 188° & 192°, S4's@ 91° & 269°. No indications observed.
		VT-1	VT-1 on 25% of the S3a, S3b, and S3c welds. VT-1 of sparger brackets (SB) at 90°, 92°, 119°, 149.5°, 210.5°, 241° and 268°. No indications observed.
Top Guide (Rim, etc.)	1991-1995	VT	VT of top guide beams of fifty (50) cells was performed in 1991 per RICSIL 059. No indications. VT exams of the members in the load path between the top guide and core shroud in 1995 per SIL 588. One (1) indication on the 90° aligner pin keeper was observed and evaluated as acceptable (indication not on load bearing portion of assembly).
	Spring 1997 (RE17)	VT -1	VT-1 re-examination of Top Guide Aligner Pin located at 90° in accordance with SIL 588, R1. Indication on aligner pin keeper did not appear to change in size.
	Spring 2000 (RE19)	VT -1	VT-1 of two (2) hold down assemblies. No indications.
	Fall 2001 (RE20)	VT -1	VT-1 of two (2) horizontal aligner pins with no new indications. VT-1 of four (4) hold down assemblies.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld.
	Fall 2006 (RE23)	VT-1	VT-1 on two (2) hold down assemblies and aligner pin assemblies at 90° and 270°. A previous indication identified on the non-load bearing keeper of the aligner pin assembly at the 90° location was observed with no apparent change. However, two (2) new but similar type indications were also observed on the same keeper. Three (3) new indications were observed on the non-load bearing aligner pin keeper at the 270° location. Indications were evaluated as acceptable.
		VT-3	VT-3 examinations performed on accessible areas of top guide per B-N-2. No indications.
	Spring 2008 (RE24)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 0 and 180°. One (1) new indication identified on non-structural keeper at 180°. Similar to indications in keepers seen at 90° and 270°. Evaluated as acceptable.
		EVT-1	EVT-1 examinations of accessible areas of Rim weld.
		VT-3	VT-3 examinations performed of accessible top guide hold down assemblies, rim pins per B-N-2.
	Fall 2009 (RE25)	VT-1	VT-1 examinations performed on hold down and aligner assemblies at 90°. No change in the indication at the 90° aligner pin keeper.
		EVT-1	EVT-1 examinations of 10% or fourteen (14) of top guide grid beams per BWRVIP-183. No indications. However, only eight (8) were credited as quality examinations.
		VT-3	VT-3 examinations of accessible areas of top guide per B-N-2.

	Spring 2011 (RE26)	VT-3	VT-3 of accessible areas of Top Guide per B-N-2. No indications.
		VT-1	VT-1 for BWRVIP-26 credit was performed on the Hold Down assemblies and Aligner Pin assemblies at 270°. An indication not previously reported was observed adjacent to the attachment weld adjoining the Aligner Block to the Top Guide. Indication appears to be a manufacturing remnant that was not completely removed during construction. Previously identified indications were also observed with no changes. Scope was expanded to include the remaining other three (3) Aligner Pin assemblies located at 0°, 90°, and 180°. VT-3 for Sect. XI B-N-2 and VT-1 for BWRVIP-26 credit was performed. Aligner Pin assembly at 0° was found to have seven (7) previously unidentified indications, with four (4) identified in the Aligner Pin Keeper and three (3) identified in the Aligner Block. Review of previous inspection video showed faint presence of indications. Evaluated as acceptable. Aligner Pin assembly at 90° was found to have one (1) previously unidentified indication located on the Aligner Pin Keeper. Review of previous inspection video showed a faint presence of the indication. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable. Aligner Pin assembly at 180° was found to have two (2) previously unidentified indications located on the Aligner Pin Keeper. Review of previous inspection video shows presents of indications. Three (3) previously identified indications were also observed with no changes. Evaluated as acceptable.

		EVT-1	EVT-1 examinations of accessible areas of the Rim weld. EVT-1 of two (2) top guide cell locations per BWRVIP-183. No indications.
	Fall 2012 (RE27)	VT-1	VT-1 examinations performed on hold down assembly at 180°. No indications.
		VT-1	VT-1 of the aligner pin assembly at 0° was performed to confirm seven (7) flaws identified in RE26. Four (4) of the flaws on the keeper were confirmed and verified to have no changes. One (1) flaw on the aligner pin block was confirmed and verified to have no changes. The two (2) other previously identified flaws on the block were determined to be non-relevant surface scratches. VT-1 of the aligner pin assembly at 90° was performed to confirm seven (7) flaws identified on the keeper in RE26. 4 of the flaws were confirmed and verified to have no changes. One (1) additional flaw on the keeper was also reported. This flaw is similar to flaws seen on the other aligner pin keepers, but could not be verified in previous video due to camera positioning. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) flaws identified in RE26. All of the flaws on the keeper were confirmed and verified to have no changes. VT-1 of the aligner pin assembly at 270° was performed to confirm four (4) flaws identified in RE26. Three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) previously reported flaw adjacent the aligner block to top guide weld was examined using an improved camera and delivery mechanism and determined to be a non-relevant surface scratch.
	Fall 2014 (RE28)	EVT-1	EVT-1 examinations of accessible areas of Rim weld. No indications

		VT-1	VT-1 examinations performed on accessible top portion of the TG hold down assembly at 0°. No indications. VT-1 of the aligner pin assembly at 0° was performed to confirm five (5) previously identified flaws. Four (4) flaws on the keeper were confirmed to have no changes. The identified flaw on the aligner pin block showed slight increase in length. VT-1 of the aligner pin assembly at 90° was performed to confirm five (5) previously identified flaws. The 5 flaws on the keeper were confirmed to have no changes. Five (5) unreported flaws on the aligner block were detected. VT-1 of the aligner pin assembly at 180° was performed to confirm three (3) previously identified flaws. The three flaws on the Keeper were confirmed to have no change. Five (5) unreported flaws on the aligner block and two (2) on the top guide were detected. VT-1 of the aligner pin assembly at 270° was performed to confirm three (3) previously identified flaws. The three (3) of the flaws on the keeper were confirmed and verified to have no changes. One (1) unreported flaw on the aligner block and one (1) on the top guide were detected.
		EVT-1	EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No crack indications identified.
	Fall 2016 (RE29)	EVT-1	EVT-1of five (5) of top guide grid beams per BWRVIP-183. No indications. EVT-1 of beams near impact site of dropped control rod blade. (Ref OE 313327). No indications identified.

		VT-1	VT-1 of accessible top portion of the TG hold down assembly at 90°. No indications.
		VT-1/ EVT-1	VT-1 and EVT-1 of aligner pin assembly at 0° confirmed five (5) previously identified flaws. All flaws showed no changes, except for Flaw 6 on the keeper which appeared longer compared to previous examination but difference was attributed to improved tooling and lighting.. VT-1 and EVT-1 of aligner pin assembly at 90° confirmed ten (10) previously identified flaws on the keeper and block. All flaws showed no changes except for, Flaw 5 (keeper) and 10 (block) which appeared longer compared to previous exam with difference attributed to improved tooling an lighting. VT-1 and EVT-1 of aligner pin assembly at 180° confirmed nine (9) previously identified flaws. All flaws showed no changes, except for Flaws 2 and 3 on keeper which appear longer compared to previous exam with difference attributed to improved tooling and lighting. One (1) new flaw was reported on the block to slider weld that was later confirmed to be present in the previous exam. Change attributed to improved tooling and lighting. VT-1 and EVT-1 of aligner pin assembly at 270° confirmed five (5) previously identified flaws that showed no changes. One (1) new flaw reported on keeper to washer weld that was later confirmed to be present in the previous exam.
Core Plate (Rim, etc.)	Fall 1995	VT-3	VT-3 examinations of Hold down bolts examined in 1995 per SIL 588. No indications.
	Spring 2000 (RE19)	VT -3*	VT-3 examinations of 48 bolts examined from top side. *(Bolts are not accessible for EVT-1)

	Fall 2001 to Fall 2009 (RE20 – RE26)	VT-3	VT-3 examinations performed on accessible areas per B-N-2. No indications.
	Fall 2012 (RE27)	VT-3	VT-3 examination of three (3) hold down bolt locations (70, 71, and 72) from the top side. No indications.
	Fall 2014 (RE28)	VT-3	VT-3 exam of 36 (50%) hold down bolt locations from the top side. No indications.
SLC	1986-2001	VT-2	VT-2 examinations of SLC penetration during Class 1 RPV pressure test each outage.
	Spring 2003 (RE23)	EVT-2	Enhanced VT-2 examinations during Class 1 pressure test. No indications.
	Spring 2005 (RE22)	EVT-2/UT	Enhanced VT-2 performed of safe-end and penetration in conjunction with ASME Section XI Class I pressure test. Manual UT to Appendix VIII performed on nozzle to safe-end weld. No indications.
	Fall 2006 (R23)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2008 (RE24)	EVT-2	Enhanced VT-2 examinations performed of safe-end and penetration in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2009 (RE25)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Spring 2011 (RE26)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.

	Fall 2012 (RE27)	UT	UT examination of N10 SLC nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
	Fall 2014 (RE28)	EVT-2	Enhanced VT-2 examinations of safe-end and penetration performed in conjunction with ASME Section XI Class I system leakage test. No indications.
Jet Pump Assembly	1986-1995	VT-1/VT-3 /UT	VT examinations on ten (10) Jet Pumps each outage. Exam includes applicable GE SILS. Jet pump beams replaced in 1985. Jet pump beam UT first performed in 1993.
	Spring 1997 (RE17)	VT-1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	Ten (10) jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Examinations deferred to Fall 2001.
	Fall 2001 (RE20)	VT-3	VT-3 examinations on all 20 jet pump nozzle inlets per SIL 465. No indications.
		VT-1	VT-1 examinations on all WD-1's. No indications.
		EVT-1	EVT-1 examinations on BB-1 and BB-2 on JP's 1-10. EVT-1 on MX-2's on JP's 1 – 10. EVT-1 on RB-1's and RB-2's on JP's 1/2, 3/4, and 5/6. No indications. EVT-1 on RS-1's, RS-2's, and RS-3's on JP's 1 – 10. EVT-1 on RS-6's on JP's 1, 3, and 5. EVT-1 on RS-7's on JP's 2, 4, and 6. EVT-1 on RS-8's and RS-9's on JP's 1/2, 3/4, and 5/6. No indications.
	Spring 2003 (RE21)	VT-3	VT-3 examinations on the JP nozzle inlet mixers on JP's 11 - 20 per SIL 465. VT-3 examinations of set screws, gaps, and tack

			welds on JP's 1 – 20 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on the IN-4 on JP's 5, 6, 11, 12, 13, and 14. EVT-1 examinations on the MX-2 on JP's 11, 12, 13, and 14. EVT-1 examinations on the RB-1's and RB-2's, on JP's 11/12 and 13/14. EVT-1 examinations on RS-1 and RS-2 on JP's 11/12, 13/14, 15/16, and 17/18; RS-6 on JP's 11 and 13; RS-7's on JP's 12 and 14; RS-8's and RS-9's on JP's 11/12, 13/14. No indications.
		UT	UT examinations on the BB-1's and BB-2's for JP's 1 – 20. No indications.
	Spring 2005 (RE22	VT-3	VT-3 on the JP nozzle inlet mixers on JP s 1 – 10 per SIL 465. No indications.
		VT-1	VT-1 examinations on JP set screws, gaps and tack welds on JP's 1, 2, 15, and 16 per SIL 574. No indications.
		EVT-1	EVT-1 examinations on RS-1, RS-2, and RS-3 welds on JP's 1 and 2 and the IN-4 welds on JP's 7, 8, 9, and 10. No indications.
	Fall 2006 (RE23)	VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 9, 10. VT-1 of WD-1 at JP's 9, 10. No indications.
		EVT-1	EVT-1 of RS-1 and RS-2 on JP's 15/16 and 19/20.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of IN-4's at JP's 19 and 20. EVT-1 examinations of RB-1a's, -1b's, -1c's, and -1d's between JP's 9/10 and 19/20. EVT-1 examinations of RB-2a's, -2b's, -2c's, and -2d's between JP's 9/10 and 19/20. EVT-1 examination of RS-3 between JP's 19/20. EVT-1 examinations of RS-6 at JP's 9 and 19. EVT-1 examination of RS-7 at JP's 10 and 20. EVT-1 examinations of RS-8 and RS-9 at JP's 19/20 and 9/10. No indications.

		UT	UT of BB-1, -2 and -3 on all 20 JP beams. No indications. UT of MX-2 (and AD-1, AD-2, DF-1, DF-2, DF-3 note in Diffuser Section) on all 20 jet pumps.
	Fall 2009 (RE25)	VT-3	VT-3 of JP nozzle inlets per SIL465 on JP's 15, 16, 17 and 18. No indications.
		VT-1	VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 10. 15, 16, 19, and 20. VT-1 of WD-1 at JP's 17, and 18. No indications.
		EVT-1	EVT-1 examinations of IN-4 on JP's 15, 16, 17, and 18. EVT-1examinations of RB-1's and RB-2's on JP's 7/8, 15/16, and 17/18. EVT-1 examinations on RS-1's and RS-2's on JP's 11/12 and 17/18. EVT-1examinations on RS-3's on JP's 11/12, 15/16, and 17/18. EVT-1 examinations on RS-6's on JP's 7, 15, and 17 and RS-7's on JP's 8, 16, and 18. EVT-1 examinations on RS-8's and RS-9's on JP's 7/8, 15/16, and 17/18. No indications.
	Spring 2011 (RE26)	VT-3	VT-3 of JP nozzle inlets on JP 9 and 10. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed.
		EVT-1	EVT-1 of RS-8 and RS-9 on JP-1 thru JP-14, JP-19, and JP-20. No indications. EVT-1 of JP-9 and JP-10's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-3, RS-1, RS-2. EVT-1 of JP-9's RS-6 and JP-10's RS-7. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of JP-13 and JP-14's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, & RS-3.

			EVT-1 of RS-6 on JP-13 and RS-7 on JP-14. No indications. EVT-1 of JP-7 and JP-8's RS-3. No indications. EVT-1 of JP-15 and 16's RS-3. No Indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1, 2, 9, 10, 13, 14, 15, 16, 19, & 20. No indications of movement or wear observed. VT-1 of the JP-15 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of 0.003" with no signs of movement. Vessel side set screw confirmed to have partial contact. No indications on slip joint. VT-1 of the JP-20 set screw gaps and slip joint. Previously identified shroud side gap was found to have an increase of .004" with no signs of movement. Newly reported Vessel side set screw gap measured to be .013". No indications on slip joint.
		VT-3	VT-3 of JP nozzle inlets on JP-13 and 14. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of MX-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 of JP-1 and JP-2's IN-4, RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6 on JP-1 and RS-7 on JP-2. No indications.
		VT-1	VT-1 of the JP Restrainer Wedge (WD-1) at JP-1 thru JP-20. No indications of movement or wear observed. VT-1 of the set screws and auxiliary wedges on Jet Pump 1, 2, 9, &10. JP10 had a previously identified shroud side gap that was found to be 0.011" with no

			signs of movement. JPs 1, 2, and 9 set screws and aux wedges were found to be in full contact with no signs of wear.
		VT-3	VT-3 of JP nozzle inlets on JP-1 and 2. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of MX-2 and IN-4 on JP-6. No Indications.
			EVT-1 of RS-1, RS-2, and RS-3 on JP-3&JP-4 and RS-1 and RS-2 on JP-7&JP-8. No Indications
			EVT-1 of JP-5&JP-6's RB-1a, RB-1b, RB-1c, RB-1d, RB-2a, RB-2b, RB-2c, RB-2d, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, and RS-9. No Indications.
		VT-1	VT-1 of set screw gaps and slip joints on JP-15 and JP-20. No Indications.
			VT-1 of the JP Restrainer Wedge (WD-1) at JP-5 and JP-6. No indications.
		VT-3	VT-3 of JP nozzle inlets on JP-6. No indications.
Jet Pump Diffuser	1986-1998	VT -3	10 Jet Pumps VT-3 examined each outage. No indications. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998 (RE18)	VT-1/VT-3	VT examinations on ten (10) jet pumps. Exam includes applicable GE SILs. No indications.
	Spring 2000 (RE19)	N/A	Exams deferred to Fall 2001.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on ten (10) jet pumps (5 assemblies). Identified an indication thought to be a broken jet pump sensing line upper bracket retaining weld. Evaluated as acceptable.

	Spring 2003 (RE21)	VT-3	VT-3 on JP sensing lines for all jet pumps per SIL 420. No indications.
		VT-1	VT-1 on sensing line brackets for all jet pumps per SIL 420. Previously reported cracked bracket weld was determined not to be cracked. No indications.
		EVT-1	EVT-1 examinations of AD-1, AD-2, AD-3a, AD-3b welds on JP's 11 through 20. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 on JP sensing lines for JP's 1 – 11 and 14 per SIL 420. No indications.
		VT-1	VT-1 on JP sensing line brackets for JP's 1- 11 and 14. No indications.
	Fall 2006 (RE23)	EVT-1	EVT- 1 on AD-1 on JP's 1, 2, and 5. EVT-1 examinations on AD-2, AD-3a, AD-3b, DF-1 on JP-15, 16, 17, 18, 19, and 20 and DF-2 on JP's 15, 16, 19, and 20. No indications.
	Spring 2008 (RE24)	UT	UT on AD-1, AD-2, DF-1, DF-2, and DF-3 (and MX-2). One (1) indication on DF-1 at JP-14.
		EVT-1	EVT-1 examinations on DF-1 at JP-14 in addition to UT. Appeared to be a defect from original construction.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of indication to DF-1 on JP-14 identified during the previous outage. No change.
	Spring 2011 (RE26)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication was found to have no changes.
	Fall 2012 (RE27)	EVT-1	EVT-1 re-examination of indication located on the inside surface of JP-14 at the DF-1 weld. Indication did not change.
	Fall 2014 (RE28)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-1, DF-2 on Jet Pumps 1, 2, 8, 9, & 10. No Indications. EVT-1 re-examination of indication located on the inside surface of

			JP-14 at the DF-1 weld. Indication did not change.
	Fall 2016 (RE29)	EVT-1	EVT-1 of AD-1, AD-2, AD-3a, AD-3b, DF-2 on Jet Pumps 3, 4, 5, 6, & 7. No indications. EVT-1 of DF-1 (outside diameter) on Jet Pumps 6 and 14. No Indications. EVT-1 of DF-1 (inside diameter) for re-examination of indication on the inside surface of JP-14. Indication showed no change.
CRD Guide Tube	Fall 1995	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 1997 (RE17)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Fall 1998 (RE18)	VT -3	VT-3 exams of accessible guide tubes. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of eighteen (18) anti-rotation pins and eleven (11) CRGT-1 welds. No indications.
		EVT-1	EVT-1 examinations of four (4) CRGT-2 and CRGT-3 welds. No indications.
	Fall 2001 (RE20)	VT-3	VT-3 examinations of thirteen (13) anti-rotation pins and thirteen (13) CRGT-1 welds. No indications.
		EVT -1	EVT-1 examinations of five (5) CRGT-2 and CRGT-3 welds. No indications.
	Spring 2005 (RE22)	EVT-1	EVT-1 examinations on one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Fall 2006 (RE23)	EVT-1	EVT-1 examinations of one (1) CRGT-2 weld and one (1) CRGT-3 weld. No indications.
	Spring 2008 (RE24)	EVT-1	EVT-1 examinations of two (2) CRGT-2 welds and three (3) CRGT-3welds. No indications.
		EVT-1	

	Fall 2009 (RE25)		EVT-1 examinations on one (1) CRGT-2 weld and two (2) CRGT-3welds. No indications.
CRD Stub Tube	N/A	N/A	No record of examination.
In-core Housing	NA	NA	No record of examination back to 1996
Dry Tube	1989-1991	VT	VT exam in 1989, 1990, and 1991 per SIL409R1. All dry tubes replaced in 1993.
	Spring 2005 (RE22)	VT	Replaced one (1) dry tube.
	Fall 2012 (RE27)	VT-1	VT-1 was performed on dry tube locations at 12-09 and 28-25. No indications.
	Fall 2014 (RE28)	VT-1	VT-1 performed on IRM dry tube locations at 20-25 and 36-41. No indication observed. Replaced IRM dry tube at 12-41.
	Fall 2016 (RE29)	VT-1	VT-1 on Dry Tube Locations. IRM 28-33 & 36-09 and SRM 12-33, 20-17, & 36-25. No Indications.
Instrument Penetrations	1986-2000	VT-2	VT-2 examination performed during RPV system leakage test each outage for all six (6) instrument nozzle penetrations. No indications.
	Spring 2000 (RE19)	PT	PT examination of N16A instrument penetration nozzle to safe-end weld.
	Fall 2001 (RE20)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2003 (RE21)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2005 (RE22)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
		UT	UT examination of N16 nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
	Fall 2006 (RE23)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.

	Spring 2008 (RE24)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2009 (RE25)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Spring 2011 (RE26)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2012 (RE27)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2014 (RE28)	UT	UT examination of N16B nozzle to safe-end per Risk-Informed ISI Program and Appendix VIII. No indications.
		VT-2	VT-2 examination performed during RPV system leakage test. No indications.
	Fall 2016 (RE29)	VT-2	VT-2 examination performed during RPV system leakage test. No indications.
Vessel ID Brackets	1986-1995	VT -1/VT-3	ASME XI VT-3 (non-beltline) and VT-1 (beltline examinations) of jet pump riser brace, dryer, FW Sparger, Core Spray, guide rod, and surveillance capsule holder brackets performed once per interval. No indications.
	Spring 1997 (RE17)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
	Fall 1998 (RE18)	VT -1/VT-3	VT-1/VT-3 ASME Section XI examinations on five (5) jet pump riser brackets, FW brackets and welds examined. No indications.
		EVT-1	EVT-1 examinations on four (4) CS bracket attachment welds. No indications.
	Spring 2000 (RE19)	VT-3	VT-3 examinations of guide rod attachment welds. No indications.
		VT-1	VT-1 on FW sparger brackets. No indications.

		EVT-1	EVT-1 examinations on CS bracket attachment welds. No indications.
	Fall 2001 (RE20)	EVT-1	EVT-1 examinations on all FW sparger bracket attachment welds and all dryer support attachment welds. No indications.
	Spring 2003 (RE21)	EVT-1	EVT-1 examination of on JP riser brace pad attachment weld at 150°. No indications.
	Spring 2005 (RE22)	VT-3	VT-3 examination of steam dryer hold down brackets.
	Fall 2006 (RE23)	EVT-1	EVT-1 of eight (8) FW sparger brackets and four (4) CS piping bracket attachment welds. No indications.
	Spring 2008 (RE24)	VT-3	VT-3 of guide rod attachment welds. No indications.
		EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 30°, 150°, 210°, 270°, and 330°. EVT-1 examinations of steam dryer support bracket attachment welds at 215° and 325°. No indications.
	Fall 2009 (RE25)	EVT-1	EVT-1 examinations of JP riser brace pad attachment welds at 60°, 90°, and 120°. No indications.
	Spring 2011 (RE26)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 30°. No Indications.
	Fall 2012 (RE27)	EVT-1	EVT-1 of four (4) CS piping bracket attachment welds at 30°, 150°, 210°, and 330°. No indications. EVT-1/VT-1 of JP riser brace pad attachment welds at 270°. No indications. EVT-1/VT-3 of steam dryer support bracket attachment welds at 215° and 325°. No indications.

		VT-1	VT-1 of surveillance capsule holder brackets at 300°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2014 (RE28)	EVT-1	EVT-1 of Riser Brace attachment welds on JP-1 & 2 at 150°. No indications.
		EVT-1/ VT-3	EVT-1/VT-3 of steam dryer support bracket attachment welds at 145° and 35°. No indications.
		VT-1	VT-1 of surveillance capsule holder brackets at 30° & 120°. No indications.
		VT-3	VT-3 (direct) examination of steam dryer hold down brackets @ 35°, 145°, 215°, and 325°. No indications.
	Fall 2016 (RE29)	EVT-1	EVT-1 of the JP riser brace pad attachment welds, JP-RBPAD-ATTWLDS @ 90°. No Indications.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	Fall 2001 (RE20)	VT-1	VT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2003 (RE21)	EVT-1	EVT-1 of twenty four (24) drain channel welds per SIL 474.
	Spring 2005 (RE22)	VT-1	VT-1 of leveling screws per OE 16110
	Fall 2006 (RE23)	VT-1 w/Character Card	Performed baseline VT-1 examinations to BWRVIP-139 and SIL 644, Rev 2. Re-examined five (5) minor indications previously identified per SIL 474 adjacent to several drain channels. Two (2) new indications were observed in a weld adjacent to a drain channel and both tack welds on one (1) lifting lug were observed. The indications were evaluated as acceptable.
	Fall 2009 (RE25)	VT-1 (89)	VT-1 examinations on seven (7) previously identified indications on dryer. With additional cleaning, six (6) of the

			indications disappeared with only one (1) remaining (i.e., the cracked tack welds on one (1) lifting lug - no change in the lifting lug).
	Fall 2016 (RE29)	VT-1 (89)	Performed VT-1 examinations to BWRVIP-139-A. Re-examined one (1) previous indication of cracked tack welds on lifting lug @ 145° with no changes. The other three (3) lifting lugs were observed to have similar cracked tacks that were not previously reported. Five (5) Tie Rods were reported to be slightly bent with no broken welds. One (1) additional indication was observed on the lower guide bracket weld at 180° that extended into the skirt. The indication was arrested with a 5/8th inch Stop-drill hole. No other dryer indications reported.
Dissimilar metal welds	Spring 2008 (RE24)	UT	Automated UT performed on four (4) CAT A welds per Appendix VIII. Manual UT performed on two (2) CAT A welds. All welds included in Risk-Informed ISI Program. No indications.
	Spring 2011 (RE26)	UT	Manual UT inspection performed on one (1) CAT D nozzle to cap weld (CRD Return) per Appendix VIII and Risk-Informed ISI Program. No indications.
	Fall 2014 (RE28)	UT	Manual UT inspection performed on three (3). CAT A welds per Appendix VIII. All welds included in Risk-Informed ISI Program. No indications.
	Fall 2016 (RE29)	UT	Automated Phased Array UT performed on one (1) CAT D weld and manual UT performed on one (1) CAT A weld. Both welds included in Risk-Informed ISI Program. No indications.

Reactor Internals Inspection History

Plant: **Dresden 3**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Spray Piping	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of piping and welds in annulus. Indications observed at two lower elbow to pipe welds 2P4c and 4P4c. These welds were repaired using GE designed clamps.
	4/97-R14	UT/EVT-1	UT Baseline inspections per BWRVIP-18 of all piping circ welds in annulus. Repairs removed and not reinstalled. EVT-1 of any piping welds in annulus inaccessible to scanner. Additional flaws identified on 1, 2 and 3P8a welds.
	2/99-R15	EVT-1	EVT-1 examined undemonstrated welds P8a and P4d on all four downcomers. Installed a "bumper" repair on 1P8a at the 80° downcomer.
	9/00-R16	UT/EVT-1	UT of "Target" welds and EVT-1 of all undemonstrated welds. Also EVT-1 of welds made inaccessible from repair installed on the 80° downcomer including 1P7, 1P4c, 1P4d, 1P8a and b. Welds 2P4c and 4P4c exhibited flaw growth as predicted by Flaw Evaluation.
	10/02-R17	VT-1	Six P4 welds for presence of "excessive grinding". NRI. All undemonstrated welds P8a and P4d and long seams on thermal collars, NRI
	10/04 – R18	EVT-1	Examined piping welds 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b. Eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		NA	Performed Core Spray Lower Sectional Replacement (all four downcomers) eliminating welds 1-4P4c, 1-4P4d, 1-4P8a, 1-4P8b, 1-4P5, 1-4P6, and 1-4P7.
	11/06 – R19	VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of all accessible bolting, keepers, ratchets and latch springs. NRI - VT-3 of all repair hardware. NRI

		EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
	11/08 – R20	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 4P4a, 4P4b and two piping brackets, attachment weld, pad surface and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI
	11/10 – R21	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 2P4a, 2P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. NRI.
		VT-1/VT-3	Core Spray Lower Sectional Replacement - VT-1 of 4 bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/12 – R22	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 1P4a, 1P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for one piping bracket. One RI due to partially cracked tack weld.
	11/14 – R23	EVT-1	Examined piping welds: 1P1, 2P1, 1P2, 2P2, 1P3, 2P3, 3P3, 4P3, 3P4a, 3P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for two piping brackets. RIs on both brackets due to partially cracked tack welds.
		VT-1/VT-3	Core Spray Lower Sectional Replacements (all four lines) - VT-1 of bolting, keepers, ratchet springs, latch springs, lateral pins, and keepers. NRI - VT-3 of repair hardware. NRI
	11/16 – R24	EVT-1	Examined piping welds: 1P1, 2P1, 2P2, 2P3, 3P3, 4P4a, 4P4b and two piping brackets, attachment welds, pad surfaces and HAZ of cladding. NRI.
		VT-1	Examined bolting and tack welds for three piping brackets. RIs on two brackets due to partially cracked tack welds.

Core Spray Sparger	1980's Through 1994	VT-1	IEB 80-13 (1 MIL) VT-1 of spargers and tee-boxes. NRI.
	4/97-R14	EVT-1, VT-3	Examined tee-box cover plate welds (S1), tee-box to sparger arms (S2), and sparger end caps (S4) to EVT-1. NRI. Examined sparger nozzles (S3) and the sparger piping to VT-3. NRI.
	10/00 - R16	EVT-1, VT-3	Per BWRVIP-18: EVT-1 of all S1, S2 and S4. VT-1 of 50% of S3. NRI.
	10/04 – R18	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			-All 12 sparger brackets and bracket to shroud welds. NRI. -Core Spray Lower Sectional Replacement (all four downcomers) eliminating inspection of the following welds: 1-4S1, 1-4S2a-b.
	11/08 – R20	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 1S3 (007-080°), 1S3 (080-183°), 2S3 (007-110°), 2S3 (110-183°). NRI.
			All 12 sparger brackets and bracket to shroud welds. One relevant indication identified. Indication acceptable for one cycle of operation.
	11/10 – R21	VT-1	One sparger bracket to shroud weld which had a previous indication identified in R20. No identified change. Indication acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Sparger to End Cap Welds: 1S4 (7°), 1S4 (183°), 2S4 (7°), 2S4 (183°), 3S4 (3°), 3S4 (187°), 4S4 (3°), 4S4 (187°). NRI.
		VT-1	Nozzle Tack Welds: 3S3 (187-260°), 3S3 (260-003°), 4S3 (187-290°), 4S3 (290-003°). NRI.
			All 12 sparger brackets and bracket to shroud welds. No change observed on previously identified relevant indication.
	11/14 – R23	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.

	11/16 – R24	VT-1	One sparger bracket to shroud weld which had a previous indication originally identified in R20. No identified change.
Attachment Welds	4/94-R13	VT-1	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. NRI.
	10/00-R16	VT-1	ASME Section XI B-N-2, surveillance capsule holder attachments in beltline. All six sets examined. NRI.
	10/02 - R17	EVT-1	BWRVIP-48 attachments: four dryer lugs, eight feedwater sparger end-brackets, eight Core Spray Piping brackets, attachment weld, pad surface and HAZ of cladding. NRI
	10/04 – R18	EVT-1	Four steam dryer wall support lugs, lug to pad, and pad to vessel attachment welds. Eight feedwater sparger lug to vessel attachment welds. NRI.
		VT-1	Eight feedwater sparger end-bracket lug assemblies. NRI
	11/06 – R19	VT-3	Examined attachment welds for two Core Spray piping brackets and all four steam dryer wall support lugs in accordance with ASME Section XI. NRI
		EVT-1	Inspected piping bracket to piping weld and bracket to vessel attachment weld on 2 core spray piping brackets. NRI
	11/08 – R20	EVT-1 and VT-3	- Examined attachment welds for two Core Spray piping brackets. NRI - Examined surveillance capsule holder bracket attachment welds. NRI
		VT-3	Examined steam dryer and steam separator guide rod attachment welds. NRI
	11/10 – R21	EVT-1	Examined attachment welds for two Core Spray piping brackets and two steam dryer wall support lugs. NRI
	11/12 – R22	EVT-1	Examined attachment welds for all 8 feedwater sparger end bracket attachment welds. NRI
	11/14 – R23	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI
	11/16 – R24	VT-1	Examined attachment welds for all 4 steam dryer support lugs attachment welds. NRI

Core Shroud	4/94-R13	EVT-1 and UT	Inspections per SIL 572, extensive indications in circumferential welds.
	4/97-R14	EVT-1 and UT	Inspected all shroud repair design reliant structure prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspections consisted of EVT-1 of all ring segment welds (accessible surfaces), UT for minimum ligament of all vertical welds accessible to scanner and EVT-1 for minimum ligament on all accessible surfaces of all vertical welds not accessible to the scanner.
		NA	Installed four tie-rod shroud repair assemblies and four core plate wedges.
	2/99-R15	VT-1	Examined all four tie-rod assemblies and core plate wedges at locations specified by the manufacturer (GE).
	10/00-R16	UT	Examined a 40° segment of H4 to assist in shroud qualification of Core Spray Repair. NRI.
	10/04 – R18	EVT-1	Examined Ring Segment Welds V1-V4 (Shroud Head RSWs), V8-V13 (Top Guide RSWs), and V20-V25 (Core Plate Support RSWs). Historical indications at V23 and V25 revealed no apparent change since last inspection in R14 (indications are not in HAZ. All other RSWs NRI.
	11/06 – R19	UT	GE utilized the Telescoping Shroud Scanner to perform UT on Shroud vertical welds V5-V6, V14-V19, V26-V28. Coverage obtained as follows: V5 – 80.4% V6 – 34.8% V14 – 66.8% V15 – 75.6% V16 – 80.4% V17 – 77.9% V18 – 95.5% V19 – 69.8% V26 – 13.7% V27 – 69.4% V28 – 57.6% One indication identified on V27 (1.8" in length). Indication acceptable for continued operation in accordance with BWRVIP-76.

		EVT-1	Performed one-sided EVT-1 examinations on vertical welds. NRI. Coverage as follows: V7 – 40% V29 – 40% (between H7 and H8 welds) V30 – 0% (between H7 and H8 welds) V31 – 30% (between H7 and H8 welds) V32 – 0% (between H7 and H8 welds)
		VT-3, EVT-1	Performed GE recommended inspections of shroud repair hardware. Scope included inspections to address susceptible areas based on indications found at Hatch. One RI identified due to retainer clip not engage. This retainer clip is redundant and did not require repair.
	11/08 – R20	EVT-1	Examined historical indications at V23 and V25. No apparent change from previous inspection.
	11/10 – R21	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V1, V2, V3, V4, V8, V9, V10, V11, V12, V13, V20, V21, V22, and V24. Horizontal indications were identified in the top guide ring below H2, near V12 and V13. Indications acceptable for one cycle of operation.
	11/12 – R22	EVT-1	Performed one-sided EVT-1 examinations on vertical welds V7, V29, V30, V31 and V32. Inspected previous indications V12, V13, V23 and V25. Indications evaluated as acceptable.
		EVT-1&VT-1	Inspected shroud repair hardware and core plate wedges at all four azimuths. RI-minor wear noted.
	11/14 – R23	EVT-1	- Inspected previous indications V12 and V13 with no change observed. - Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
	11/16 – R24	UT	Inspected shroud vertical welds V5-V6, V14-V19, V26-V28. One indication identified on V27 (1.8" in length). Indication acceptable in accordance with BWRVIP-76.
		EVT-1	- Inspected vertical ring welds V1-V4, V8-V13 and V20-V25. Indications noted on V12, V13, V21, V22, V23 and V25. Indications evaluated as acceptable. - Inspected shroud vertical weld V7. NRI

		VT-3	- Inspected latch pins with previous wear on two shroud repair tie rods. Slight increase in wear noted.
Shroud Support	4/94-R13	UT/VT-1	Access hole cover VT/UT for circ and radial flaws. NRI.
	4/97-R14	EVT-1	Examined H8 and H9 for about 12" at 4 locations of shroud repair hardware attachment areas. NRI.
	2/99-R15	EVT-1	Per BWRVIP-38: Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI. Requirements for this inspection cycle are satisfied. NRI.
	10/02- R17	EVT-1	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	10/04 – R18	EVT-1	Examined H8 and H9 between Jet Pumps 10 and 11 (132°-177°). NRI
	11/06 – R19	EVT-1, VT-3	VT-3 of accessible areas of H9 and EVT-1 of 10% of H9 (between Jet Pumps 10 and 11). NRI.
	11/08 – R20	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°). NRI.
	11/10 – R21	UT	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. NRI.
	11/12 – R22	EVT-1	Examined H8 and H9 between Jet Pumps 20 and 1 (312°-357°) and Jet Pumps 10 and 11 (132°-177°). NRI.
SLC	10/02 - R17	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/06 – R19	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/10 – R21	PT	PT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
	11/14 – R23	UT	UT of surface of Safe-end extension and safe-end to nozzle weld. NRI.
Jet Pump Assembly	4/94-R13	VT-1	Hold down beams, beam bolt keepers, lockplates 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. Prior to R13, visually inspect 100% of upper areas of each Jet Pump including beam retainers every other outage.

	4/94-R13	VT-1	Riser brace arm to yoke welds on three upper (secondary) riser braces found cracked. Repairs are not required. No other reportable indications.
			Diffuser to baffle plate welds on all twenty jet pumps. NRI.
	4/97-R14	EVT-1	All ten RS-1, 2, 3, 4 and RS-5. NRI.
	2/99-R15	EVT-1	Initiate BWRVIP-41: Medium Priority: 50% of DF-1, MX-1, MX-3 and IN-5 welds. All twenty RB-1, 2, RS-8 and RS-9. NRI. High Priority: 50% of DF-2, AD-1, 2 and 3. NRI.
		VT-1	Examined all twenty WD-1 locations. NRI.
	10/02-R17	EVT-1	Repeat examination of four DF-2 welds to improve coverage. NRI.
			Five RS-9 and 10 riser to secondary brace yoke welds, NRI. Eleven secondary brace RB-3 welds per ASME XI and BWRVIP-48. NRI.
	03/03-D3M09	VT-1	Verified acceptable restrainer set-screw gaps when replaced beams (reference Jet Pump Beams section of this report). Aux wedges installed two set-screw locations. The other locations were NRI.
	10/04 – R18	VT-1	Examined jet pump sensing line clamps on jet pumps 1, 2, 3, 10, 11, 12, 13, & 20.
		EVT-1	Examined all twenty WD-1 locations. Noted normal movement of wedges 11 & 20 with no abnormal wear. All other wedges NRI.
			Examined AS-1 (set-screw gaps) on five jet pumps: 8 (Vessel Side, Shroud Side), 9 (VS, SS), 11 (SS), 12 (VS, SS), 20 (VS, SS). No unacceptable gaps were identified (all less than 0.010").

			Examined AS-2 (set-screw tack welds) on five jet pumps: 8 (VS, SS), 9 (VS,SS), 11 (SS), 12 (VS, SS), 20 (VS,SS). Lack of fusion of tack welds was identified on jet pumps and set screws: 9 (VS), 11 (SS), & 13 (VS). Indications noted on the tack welds for 9 and 13 were accepted as-is for one-cycle. Jet pump 11 had a set screw missing from its housing. The set-screw was retrieved and an auxiliary wedge was installed. Also discovered during the inspection of jet pump 11 was a poor quality tack weld on the swing-gate keeper. The condition of the bolt keeper was accepted for one cycle.
			The auxiliary wedge installed during D3M09 on jet pump 13 was examined and historical cracking was re-identified on the set-screw mounting block. This indication is historical and was caused by the ejection of the inlet-mixer following the failure of a beam-bolt. The indication has been accepted as-is. Also discovered on jet pump 13 was a gap between the vessel side restrainer bracket and the swing gate. The condition of the bracket and swing gate was accepted for one cycle.
			Examined RS-10 & -11 on jet pumps: 2, 3, 4, 12, & 13. NRI. Examined RS-1, 2, & 3 on five jet pump pairs: 1/2, 3/4, 9/10, 11/12, 13/14. NRI.
		UT	Examined MX-3a&b, DF-1, -2 & -3 and AD-1, -2 on jet pumps: 2, 3, 4, 5, 8, 9, 12, 13, 18, & 19. NRI.
	11/06 – R19	EVT-1	Examined RB-1 & 2 on jet pumps: 1, 2, 3, 4, & 20. NRI Examined RS-4 & 5 on jet pump pairs: 9/10, 11/12, 13/14. NRI Examined RS-8 & 9 on jet pump pairs: 1/2, 3/4, 5/6. NRI Examined MX-1 and IN-5 on jet pumps: 1, 2, 3, 4, 5, 11, 12, 13, 14, and 15. NRI
		VT-1	Examined aux wedge on JP 11. RI for slight wear on JP 11 aux wedge. Justified continued operation for one cycle. Examined main wedge WD-1 on JPs 1, 2, 3, 4, and 11 for wedge wear. NRI.

		NA	- Installed new ratchet style swing gate on JP 11 to address degraded keeper tack weld identified in R18. - Staked threads due to cracked tack welds (found in D3R18) and installed aux wedges on JP 9 vessel side and JP 13 vessel side set screws.
	11/08 – R20	EVT-1	Examined RB-3 on JPs 1, 2, 3, 4 and 5. NRI
		VT-1	- Examined aux wedges on JPs 9, 11 and 13. RI for slight wear on JPs 9 and 11 aux wedges. Justified continued operation for one cycle. - Examined AS-1 on JP 9 SS and JP 11 VS. NRI - Examined main wedge WD-1 on JPs 1, 2, 7, 8, 9, 11, 12, 13, 14, 17, 18, 19 and 20 for wedge wear. One RI for a bent main wedge handle. Condition acceptable as-is. - Examined swing gate keeper tack welds on JPs 7, 8, 9, 10 and 20. NRI - Examined JPs 1 and 2 transition pieces and sensing lines to address operating trends. NRI - Examined JP 11 swing gate bolting and ratchets. Swing gate installed in D3R19. NRI
	11/10 – R21	EVT-1	- Examined AD-1, AD-2, AD-3a, AD-3b on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI - Examined MX-3a and DF-1 on jet pumps 1, 10, 11, 14 and 15. NRI. - Examined MX-3b and DF-2 on jet pumps 1, 6, 7, 10, 11, 14, 15, 16, 17 and 20. NRI. - Examined RS-1, RS-2, and RS-3 on jet pumps risers 5-6, 7-8, 15-16, 17-18 and 19-20. NRI. - Examined RS-8, -9, -10, and -11 on all of the jet pumps. NRI. - Examined RB-1 on jet pumps 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19. NRI.

		VT-1	- Replaced an aux wedge on JP 11. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined (secondary) riser brace arm to yoke welds on jet pump 19. RI with the condition acceptable as-is. - Examined swing gate latches and welded keepers on jet pumps 4, 5, 6, 15 and 16. NRI - Examined sensing line clamps on jet pumps 1 and 20. NRI - Examined main wedge WD-1 on JPs: 3, 4, 5, 6, 10, 15 and 16 for wedge wear. NRI
	11/12 – R22	EVT-1	- Examined RB-2 welds on jet pumps 9-12 & 19. NRI - Examined RS-4 & RS-5 on JP risers 1/2, 17/18 & 19/20. NRI - Examined RS-2 on JP risers 1/2, 3/4, 9/10, 11/12 & 13/14. NRI - Examined MX-1 welds on JPs 6-10. NRI - Examined RB-3 welds on 5 JPs. NRI - Examined JP-11 BB-2. NRI
		VT-1	- Examined RB-3 welds on all 20 JPs. NRI - Examined WD-1 on JPs 1, 2, 8, 11, 12 & 14. NRI - Examined swing gate keeper tack welds on JPs 1, 12, 13, 14 & 19. NRI - Examined Aux wedges on JPs 9 & 11. RI - Some wear was observed. - Examined vessel side AS-1 on JP 11. NRI
		VT-3	- Examined IN-5 bolting on JPs 6-10. NRI - Examined slip joint on JP 11. NRI
	11/14 – R23	VT-1	- Examined WD-1 on all jet pumps. RIs for wear on jet pump 9 and bent bail handles on jet pumps 17 and 20. - Examined swing gate keeper tack welds on four jet pumps and swing gate ratchets on one jet pump. NRI - Examined Aux wedges on JPs 9 & 11. RI - Wear was observed with both auxiliary wedges. - Examined vessel side AS-1 on JP 11 and shroud side AS-1 on JP 9. NRI

		VT-3	- Examined sensing line clamps on six jet pumps. RI on JP 12 due to gap between clamp and sensing line standoff bracket. - Examined jet pump 9 slip joint. NRI
	11/16 – R24	EVT-1	- Examined MX-3a and DF-1 on jet pumps 6, 7, 16, 17 and 20. NRI. - Examined MX-3b on jet pumps 9, 12, 13, 18 and 19. NRI. - Examined AD-1, AD-2, AD-3a and DF-2 on jet pumps 2, 3, 4, 5, 8, 9, 12, 13, 18 and 19. NRI. - Examined RS-1 and RS-3 on jet pumps risers 1-2, 3-4, 9-10, 11-12 and 13-14. NRI. - Examined RS-8 and -9 on jet pumps 11-12, 13-14 and 15-16. NRI. - Examined RS-10 and -11 on jet pumps 1-2, 11-12 and 15-16. NRI. - Examined RB-1 on jet pumps 1, 2, 3, 4 and 20. NRI. - Examined AS-1 on JP 9 shroud side and JP 11 vessel side set screws. NRI.
		VT-1	- Replaced aux wedge on JP 11 and installed slip joint clamps on jet pumps 11 and 12. - Examined aux wedge on JP 9. No change to wear identified in R20. - Examined aux wedge on JP 13. Minor wear noted. - Examined main wedge WD-1 on JPs: 4, 5, 7, 10, 11 and 19 for wedge wear. NRI - Examined main wedge WD-1 on JP 9. No change to previous wear.
		VT-3	- Examined sensing line clamp on JP 12. No change to previous indication.
Jet Pump Beams	4/94-R13	UT	Jet pump beams are UT examined each outage using technique capable of detecting cracking at throat and ears. Original group 1 beams.
	4/97-R14	UT	Examined all beams. Two beams with indications replaced. Balance NRI
	2/99-R15	UT	Examined all beams. NRI
	10/00-R16	UT	Two beams with indications replaced with group 2 style beams. Balance NRI.
	03/03-D3M09	NA	Replaced all 17 original beams with weld-less keeper Group 2 beams.

	10/04 – R18	VT-3	Examined 17 group 2 beam bolt retainer mechanisms (weld-less keeper) to ensure all keepers were engaged. NRI.
		EVT-1	Examined 3 group 2 welded keeper style beams. BB-1 and BB-2 on Jet Pumps 5, 8, and 13. NRI.
	11/06 – R19	NA	Pre-emptive replacement of aging beams on JPs 5, 8 and 13 rather than UT examine.
	11/08 – R20	VT-1	- Examined beam ratchet engagement on JPs 5, 8 and 13 after 1 cycle of operation. NRI - Examined beam and ratchet engagement on JPs 1 and 2 to address operating trends. NRI
	11/12 – R22	UT	Examined BB-1, BB-2 and BB-3 on 18 of 20 jet pump beams (Group 2). NRI
	11/14 – R23	UT	Examined BB-1, BB-2 and BB-3 on jet pump 11 beam (Group 2). NRI
		VT-1	Examined all 20 jet pump beam retainer clips. NRI
LPCI Couplings	NA		
Lower Plenum	4/97-R14	MVT-1	CRD Stub Tube, CRD H7. NRI.
	4/97-R14	MVT-1	ICH/RPV-1 and ICHGT/ICH-1, two inspected from cell H7. NRI.
	10/00-R16	EVT-1	Per BWRVIP-47: examined CRGT-1, 2 and 3 on D10. NRI.
	10/02-R17	EVT-1 and VT-3	Examined 9 CRGT-1, 2 and 3 and FS/GT-ARPIN. NRI. This completes first 5% in 6 years.
	10/04 – R18	VT-3	Bottom Head Drain cleaning project created access for the following examinations: - Examined eight Stub Tube to Vessel Welds (ST/RPV-1) and eight Stub Tube to CRD Housing Welds (CRDH/ST-1) in cells: F7, G6, G7, G8, H7, H8, H9, and J8. NRI. - Inspected two locations for Core Plate to Stiffener Plate Stitch welds: G7 & G8 beam welds. NRI. - Examined two locations for Stiffener Plate to Stiffener Rods welds: G7 and H8 beam tie rods. NRI.
	11/08 – R20	VT-3	Examined 9 CRGT-1 and FS/GT-ARPIN. NRI. This completes 10%.

		EVT-1	Examined 9 CRGT-2 and 3. NRI. This completes 10%.
	11/10 – R21	VT -3	Installation of a plug in the bottom head drain to support drain line valve maintenance created access for the following examinations from cells G7 and H8: - Examined accessible portions of eight Stub Tube to Vessel (ST/RPV-1) welds, eight Stub Tube to CRD Housing (CRDH/ST-1) welds and eight CRD Housing to Cap (CRDH-1) welds. NRI. - Examined accessible portions of four In-Core Monitor Housing to Vessel (ICH/RPV-1) welds, four In-Core Monitor Housing to In-Core Housing Guide Tube (ICHGT/ICH-1) welds, two In-Core Housing Support Hardware to In-Core Housing Guide Tube (ICHS/ICGT-1) tack welds and four In-Core Housing Support (ICHS-1) hardware tack welds. NRI.
Feedwater Spargers (Not in BWRVIP Scope)	11/06 – R19	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on four brackets. Justified operation for one cycle. Inspected sparger repair hardware from D2R18 isokinetic probe retrieval. NRI
	11/08 – R20	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. RI – Wear identified between head of pin and bracket on five brackets. Justified operation for one cycle.
	11/10 – R21	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. No apparent change in wear from R20.
	11/12 – R22	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R21. Performed inspections of spargers, arm welds and t-box welds. RI - Dent on one nozzle.
	11/14 – R23	VT-1	Inspected all of the end bracket pins for tack weld and pin wear. Minor increase in wear compared to R22.

Steam Dryer	10/04 – R18	"Best Effort" VT-1	- Examined exterior surfaces including outer hoods, historical repair areas, tie bars and attachment welds, four lifting assemblies, four hold down assemblies, two man way covers, cover plates, fourteen gussets, upper ring welds, vertical guide welds, outlet plenum lower horizontal welds, outlet plenum vertical welds, and perforated plates. Multiple indications identified, including structural fatigue flaws in the outer hood areas. Outer hoods modified to repair cracking. - Examined interior surfaces including: drain channel welds, supports, vertical and horizontal plates, support ring, horizontal cross beams, and horizontal cross beam gussets. Initial start-up steam sample probe discovered missing. Probe located and retrieved from steam separator. Multiple non-structural indications also noted.
		VT-3	Examined interior and exterior skirt. Indications noted.
	11/06 – R19	"Best Effort" VT-1	Performed VT-1 inspection of outer hood welds on old dryer where previous indications had been identified and repaired. NRI.
		NA	Installed new dryer.
	11/08 – R20	"Best Effort" VT-1	Examined critical components on steam dryer after one cycle of operation per GE recommendations. One RI where dryer contacted steam separator guide rod (RI on guide rod also). Dryer and guide rod indications acceptable for one cycle of operation.
	11/10 – R21	"Best Effort" VT-1 and VT-3	Examined critical components on steam dryer. The RI from R20 where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change on both the SS guide rod and the SD.
	11/12 – R22	"Best Effort" VT-1 and VT-3	- Examined critical components on steam dryer. The previous RI where the dryer contacted the steam separator guide rod (RI on guide rod also) showed no change. - Examined dryer support lugs. Minor indications noted due to contact with the dryer.

	11/14 – R23	VT-1	- Examined the previous RI where the dryer contacted the steam separator guide rod with no change noted on dryer and guide rod. - Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
	11/16 – R24	VT-1	- Examined all four dryer support lugs. Minor indications noted due to contact with the dryer.
Top Guide	4/94-R13	VT-1	Examined beam intersections in five cells in response to industry experience. NRI.
	4/97-R14	VT-1	Per BWRVIP-26, baseline examined all four top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at the four aligner assembly locations. NRI.
	10/00-R16	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined rim weld 11. NRI.
	10/04 – R18	VT-1	Examined 90° and 180° top guide alignment assemblies. NRI.
		EVT-1	Examined rim to bottom plate weld at 90° and 180°. NRI.
	11/06 – R19	EVT-1	Examined rim weld from cell 03-34. NRI
	11/08 – R20	VT-1	Examined 0° and 270° top guide alignment assemblies. NRI.
		EVT-1	Examined top guide rim weld. NRI
	11/12 – R22	EVT-1	- Top guide rim weld was inspected at accessible locations. NRI - Top guide grid beams were inspected from 10% of the cells (18 cells). NRI.
		VT-1	The aligner pins and sockets at all four locations. Indications identified at all four aligner blocks. Indications evaluated as acceptable for one cycle.
	11/14 – R23	VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. No change to previously identified indications.
	11/16 – R24	EVT-1	Top guide rim weld was inspected at accessible locations. NRI
		VT-1	Examined aligner pins and sockets at all four locations. One new indication identified. New growth was observed on one of the previously identified indications.

Vessel	10/02 – R17	UT	Examined vertical welds SC1A, SC1C, SC2B, SC3A, SC3B, SC3C, SC3D, SC4A, SC4B, SC4C, and SC4D. NRI.
	10/04 – R18	UT	- Examined vertical welds SC1B, SC2A, SC2C, SC3A, and SC3B. NRI. Satisfies third interval Section XI inspection requirements. - Examined two original vessel construction base metal repair areas in beltline as required by Section XI. NRI.
		VT-3	Inspected cladding in accordance with ASME Section XI. NRI.
	11/06 – R19	VT-3	Inspected the reactor vessel cladding from the shroud flange to the reactor flange in accordance with ASME Section XI. NRI
	11/12 – R22	UT	Examined all 14 vertical welds, the flange to shell circumferential weld and two original vessel construction base metal repair areas in beltline as required by Section XI. All identified indications acceptable per Table IWB-3510-1.
		EVT-1	Examined weld and heat affected zones on four level instrument nozzles. NRI
Nuclear Instrument Dry-tubes (Not in BWRVIP Scope)	4/94 - R13	VT-1	Identified one cracked dry tube (24-37). Replaced. Examined every other outage to date. Per Reutter-Stokes recommendations, have not reached manufacturer's service life.
	11/06 – R19	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/08 – R20	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/10 – R21	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. RI identified movement on one IRM between the plunger and the Top Guide. Rub marks were also noted on the plunger. Acceptable as-is.
	11/12 – R22	VT-1	Examined two SRM and four IRM dry tubes from 3 cells to meet SIL 409. NRI
	11/14 – R23	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI
	11/16 – R24	VT-1	Examined two SRM and four IRM dry tubes from 2 opposite cells to meet SIL 409. NRI

Steam Separator (Not in BWRVIP Scope)	10/04 – R18	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear that was evaluated as-is for continued operation. Examined eight standpipe to shroud head welds and eight gusset to ring welds, NRI.
	11/10 – R21	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation. Replaced two SHBs. One of the two was missing the pin and the other had excessive pin to window wear.
	11/12 – R22	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/14 – R23	VT-1	Examined shroud head bolt pin and window condition. RI identified minor wear on multiple bolts that was evaluated as-is for continued operation.
	11/16 – R24	VT-1	Examined pin and window condition on 2 shroud head bolts. No change to previous wear.
Piping Welds (BWRVIP-75-A)	11/08 – R20	UT	Performed manual UT on four (4) IGSCC Category C welds and two (2) IGSCC Category A welds. None of these welds were dissimilar metal (DM) welds. No relevant indications identified.
	11/10 – R21	UT	Performed manual UT on six (6) IGSCC Category D welds. Five of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/12 – R22	UT	Performed manual UT on seven (7) IGSCC Category D welds. Four of these welds were on the reactor head spray system and three were on the reactor head vent system. Four of these welds were dissimilar metal (DM) welds. No relevant indications were identified.
	11/14 – R23	UT	Performed manual UT on nine (9) IGSCC Category C welds. None of these welds were dissimilar metal (DM) welds. No relevant indications were identified.

	11/16 – R24	UT	Performed UT exams on six IGSCC Category D welds. Two were on the HPCI system and four on the ISCO system. All six of these welds were DM welds. Five of the welds had automated exams performed. No relevant indications were identified.
Cast Austenitic Stainless Steel	11/12 – R22	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/14 – R23	EVT-1	Inspected one of each of the following: fuel support piece; control rod guide tube base; jet pump mixer flange, mixer flare, mixer ring, inlet/mixer nozzle and inlet mixer elbow. NRI
	11/16 – R24	EVT-1	Inspected one fuel support piece and one control rod guide tube base. NRI

Reactor Internals Inspection History

Plant: **Duane Arnold Energy Center**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1995	UT	Performed ultrasonic examination of the accessible areas. Baseline per BWRVIP-01; no indication were detected.
	2001	UT	Performed ultrasonic examination of the H1-H7 welds, no indications found.
	2010	Phased Array UT	Unable to complete the ultrasonic examination of the accessible areas due to equipment issues. Performed OD EVT-1 inspections to supplement and submitted Deviation Disposition to do the UT exams in 2012. No indications found.
	2012	Phased Array UT	Indication on H1 weld, approx. 1" long and 1/8" deep, ID. All other welds no indications.
Access Hole Covers	2012	Phased Array UT	Performed ultrasonic examination of 0° and 180° AHC. Two indications found on each AHC up to 70% through wall and 30% around. Evaluated in accordance with BWRVIP-180.
Shroud Support	1988/1993	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	1998	VT-3	VT-3 of shroud support.
	1999	VT-3	Shroud Support including H-8/H-9 (360 degrees).
	2001	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	2003	VT-3	Shroud Support including H-8/H-9 (180 to 360 degrees).

	2005	VT-3	Shroud Support including H-8/H-9 (0 to 180 degrees).
	2007	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of 180° of the shroud plate including both access hole covers – no indications.
	2009	VT-3	Shroud Support including the H-8/H-9 (0 to 180 degrees) – no indications.
	2012	EVT-1 VT-3	Performed EVT-1 of 10% of the H-8 and H-9 weld. Completed VT-3 of H8/H9 – no indications.
Core Spray Piping	96 (portion every RFO)	VT	Performed Visual Examination (EVT, CSVT, VT-3), baseline per BWRVIP-18, no indications were detected.
	1998	EVT-1	Reinspection per BWRVIP-18 – no indications.
	1999	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2001	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2003	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2005	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2007	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2009	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2010	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2012	EVT-1	Reinspection per BWRVIP-18 – no indications.

	2014	EVT-1	Reinspection per BWRVIP-18 – no indications.
	2016	EVT-1	Reinspection per BWRVIP-18 – no indications
Core Spray Sparger	96 (portion every RFO)	VT	Performed Visual Examination (CSVT, VT-3), baseline per BWRVIP-18, no indications were detected. One sparger nozzle is inspected every other RFO due to a missing tack weld.
	1999	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2001	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2005	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted.
	2009	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2012	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
	2014	EVT-1 VT-1	Examined S-1, S-2, and S-4 welds with EVT-1. Examined S-3A/B with VT-1 – no indications.
Top Guide (Rim, etc.)	1995	VT-1 (1/2 mil wire)	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. 100% inspection of the grid locations has been completed over the past three RFOs.
	1998	VT-3	VT-3 0° location.
	1999	VT-3	Examined nine cells (top general and bottom of grid areas).
	2001	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect the two hold down assemblies.

	2003	VT-3	Examined five cells (top general and bottom of grid areas).
	2005	VT-1	Inspection of the 1/4" fillet weld on the contour wedge and verified that alignment blocks in place. Also inspect two hold down assemblies.
	2005	VT-3	Examined four cells (top general and bottom of grid areas).
	2007	VT-1	Performed VT-1 examination of the bottom side of eight grid locations – no indications.
	2009	VT-1 VT-3	Performed VT-1 of the Latches at 46° and 226° location. VT-1 of the fillet welds on the contour wedges at 90° and 270°. Was not able to obtain 100% coverage of the fillet welds on the contour wedges due to the fuel being in the way. Will re-schedule in 2010. Performed VT-3 of the top guide – no indications.
	2010	VT-1 VT-3	Performed VT-1 of the Latches at 136° and 316° location. VT-1 of the fillet welds on all contour wedges. Performed VT-3 of the top guide – no relevant indications.
		EVT-1	Performed EVT-1 at Grid Locations 42-27, 42-23, 22-43, 22-03, 02-23, and 02-19 – no relevant indications.
	2014	VT-1	Performed VT-1 of the Latches at 226° location – no relevant indications. Performed VT-1 of the contour wedges and fillet welds at 90° and 270°. Was not able to obtain 100% coverage of the contour wedges and fillet welds due to the fuel bundle being in the way. Will re-schedule exams for 2016.
	2016	VT-1	Performed VT-1 of the contour wedges and fillet welds at 90° and 270° and verified that alignment blocks in place. Previous indications identified in 2010 have not changed. An additional shallow indication was found on a contour wedge

			and on an alignment block. Will schedule exams for 2018.
Core Plate (Rim, etc.)	1995	VT-3	Verified 25% core plate bolts were in place.
	1998	VT-3	Verified 20% core plate bolts.
	1999	VT-3	Examined Fuel support castings in nine cells, no indications.
	2001	VT-3	Verified rim hold down bolts 1-54 Examined Fuel support castings in ten cells, no indications.
	2003	VT-3	Examined Fuel support castings in five cells, no indications.
	2005	VT-3	Examined Fuel support castings in twenty cells, no indications.
	2007	VT-3	Performed a general VT-3 of Fuel Support Casting in eight locations – no indications.
	2009	VT-3	Performed a VT-3 examination of Fuel Support Castings in 12 locations – no indications.
	2012	VT-3	Performed VT-3 on 12 of 54 core plate bolts – no indications
	2014	VT-3	Performed VT-3 on 14 of 54 core plate bolts – no indications.
SLC	1993	PT	Liquid Penetrant examination of the nozzle-safeend weld.
	2001	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2003	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	2005	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld.

	2007	UT	Performed Appendix VIII UT of the Nozzle-Safeend Weld – no indications.
	2016	UT	Performed Appendix VIII Automated Phased Array UT of the Nozzle-Safeend Weld – no indications.
Jet Pump Assembly	96 (sample every RFO)	VT-3	Inspection of the riser spt pads (SIL551), holddown beams (SIL330), sensing lines (SIL420), three point contact (RICSIL078). Will inspect Riser Elbow in 1998. Repair to the set screws have been completed.
	1998	MVT-1	50% of total number of jet pumps, 100% of each inspected – no indications. All hold down beams – no indications.
	1999	UT EVT-1	DF-1 on JPs 1, 2, 3, 4, 13, 14, 15, 16, IN-4, MX-2 and WD-1 on JPs 3, 4, 13, and 14, RB-1 and RB-2 on JPs 3, 4, 13 and 14. This completes all exams on 8 of 16 JPs.
	2001	EVT-1	RB-1, RB-2, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, on JPs 7 and 8. No indications.
	2003	EVT-1	RB-1, RB-2, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, and 10. RS-1, RS-2, RS-3, DF-2, AD-1, and AD-2 on JPs 5, 6, 9, 10, 11, 12. DF-1 on JPs 5, 6, 7, 8, 9, and 10. No indications. All hold down beams - no indications.
	2007	UT	Performed UT of all 16 Jet Pump. Holddown beams using GE technique – no indications.

	2007	EVT-1	AD-1 on JPs 15,16 AD-2 on JPs 15, 16 DF-1 on JPs 11, 12, 15, 16 DF-2 on JPs 15, 16 IN-4 on JPs 11, 12, 15, 16 MX-2 on JPs 11, 12, 15, 16 RB-1 on JPs 1, 2, 11, 12, 15, 16 RB-2 on JPs 1, 2, 11, 12, 15, 16 Riser Brace Pad on JPs 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16 RS-1, RS-2, RS-3 @ 324° location RS-6 on JPs 11, 15 RS-7 on JPs 12, 16 RS-8, RS-9 @ 252°, 324° locations
		VT-1	WD-1 on all 16 JPs No indications noted from any of the visual examinations.
	2009	EVT-1	DF-2 on JPs 1, 2, 3, 4, 13, 14 AD-1 on JPs 1, 2, 3, 4, 13, 14 AD-2 on JPs 1, 2, 3, 4, 13, 14 RS-1, RS-2, RS-3, TS-1A @ 36°, 72°, 288°
		VT-3	Sensing Line Clamp on JPs 1, 2, 3, 14 Sensing Line Support on JPs 4, 5, 12, 13 Sensing Line Exits at 90° and 270° No indications noted from any of the visual examinations.
	2010	EVT-1	RB-1, RB-2 on JPs 5, 6, 7, 8 RS-6, RS-7 on JPs 5, 6, 7, 8 RS-8, RS-9 on all JPs IN-4, MX-2 on JPs 5, 6, 7, 8 DF-1, DF-2 on JPs 5, 6, 7, 8 AD-1, AD-2 on JPs 5, 6, 7, 8 RS-1, RS-2, RS-3, TS-1A @ 108°, 144°
		VT-3	Sensing Line Clamp on JPs 6, 7, 8 Sensing Line Support on JPs 6, 7, 8 No relevant indications, indications on sensing line clamps were determined to be the result of initial installation.
	2012	EVT-1	DF-1, DF-2 on JPs 13, 14, 15, 16 AD-1, AD-2 on JPs 13, 14, 15, 16 RS-1, RS-2, RS-3, TS-1A @ 288°, 324°

	2014	EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 3 (at 64°), and 4 (at 80°) - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JPs 9 (208°) and 10 (224°) – no relevant indications.
	2016	UT	Performed UT of all 16 Jet Pump. Holddown beams using WesDyne technique – no indications.
		EVT-1	Performed EVT-1 on RB-1A, RB-1B, RB-1C, RB-1D ,RB-2A, RB-2B, RB-2C, RB-2D,RS-1, RS-2, RS-3, TS-1A, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1, AD-2, on JPs 11 and 12 - no relevant indications.
		VT-3	Performed VT-3 on Sensing Line Clamps on JP 11 and standoff on JP 12– no relevant indications.
CRD Guide Tube & Stub Tube	95 (every 10 years)	VT-3	Inspected accessible portions of three guide tubes and three stub tubes, no indication were detected.
	2003	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2005	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	2007	VT-3	Performed general VT-3 examination of eight locations – no indications.
Dry Tube	88 (6 cycles and then every three cycles)	VT-1 (1 mil wire)	Inspected in 1988 with indications reported, replaced with the new design.
	1999	VT-3	Inspected accessible portions of 11 dry tubes, no indications noted.

	2007	VT-1	Performed VT-1 of upper 24" of five dry tubes. Note the exam was performed on the accessible areas – no indications.
	2009	VT-1 VT-3	Performed examination on four dry tubes. Note the exam was performed on the accessible areas – no indications.
	2010	VT-1	Performed examination on six dry tubes. Note the exam was performed on the accessible areas – no indications.
	2014	VT-1	Performed VT-1 on five (5) dry tubes. Note the exam was performed on the accessible areas – no indications.
	2016	VT-1	Performed VT-1 on two (2) dry tubes. Note the exam was performed on the accessible areas – no indications.
Instrument Penetration			
Vessel ID Brackets	Every 10 years	VT1(active fuel) VT-3 all others	Per ASME Section XI.
LPCI Coupling	N/A	N/A	Not applicable to DAEC.
Top Head	1998	VT-3	No indications.
	1999	VT-3	No indications.
	2003	VT-3	No indications.
	2005	VT-3	No indications.
	2007	VT-3	Performed VT-3 of interior portion of the RPV Head – no indications.
Guide Rod	1998	VT-3	No indications.
	1999	VT-3	Both examined (found cracked tack weld on 0 degree rod which was evaluated as acceptable).
	2001	VT-3	Inspected 0 degree guide rod, no additional indications.

	2003	VT-3	Inspected 180 degree guide rod, no indications.
	2007	VT-3	Inspected 180 degree guide rod, bracket, and bracket welds – no indications.
	2009	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
	2016	VT-3	Inspected the 0° guide rod bracket and bracket welds – noted the previously identified cracked tack weld, no other indications noted.
Sample Holder Integral Attachments	1998	VT-1 VT-3	No indications.
	1999	VT-1 VT-3	108 and 288 degree examined with no indications.
	2001	VT-1 VT-3	108 degree examined with no indications.
	2003	VT-1 VT-3	36 and 108 degree examined with no indications.
	2005	VT-1 VT-3	288 degree examined with no indications.
	2007	VT-3	108° location – no indications.
	2009	VT-3	288° location – no indications.
	2012	VT-3	All upper brackets – no indications.
	2014	VT-1	All lower brackets – no indications.
Core Spray Piping & Sparger Brackets	1998	VT-3	No indications.
	2001	VT-3	No indications.
	2005	VT-3	No indications.
	2009	EVT-1	Performed EVT-1 on the Piping Brackets at 30°, 150°, 210°, and 330° - no indications.

		VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2012	VT-1	Performed VT-1 on the Sparger Brackets at 11°, 50°, 89°, 91°, 129°, 169°, 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2014	VT-1	Performed VT-1 on the Sparger Bracket at 191°, 230°, 269°, 271°, 309°, and 349° locations – no indications.
	2016	EVT-1 & VT-3	Performed EVT-1 on the Piping Bracket attachment welds and VT-3 of the attachment hardware at 30°, 150°, 210°, and 330° locations – no indications.
Jet Pump Riser Support Pad	1998	VT-1	No indications.
	2003	VT-1	216 degree pad – no indications.
	2005	VT-1	144 and 252 degree pads – no indications.
	2014	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 3 (at 64°), and 4 (at 80°) – no indications.
	2016	EVT-1	Performed EVT-1 at the Riser Support Pads of JPs 11 and 12 – no indications.
Feedwater Spargers	1998	VT-1 VT-3	Indications around flow holes.
	2001	VT-1 VT-3	No additional indications.
	2005	VT-1 VT-3	No additional indications.
	2007	VT-1	Detailed inspection of all four spargers at the following locations due to broken keeper: Vessel Attachment Keeper to pin Handle interface Keeper to Sparger Bracket weld Pin to sparger bracket Pin to wall bracket

			Sparger Bracket & Bolts Sparger Bracket to Vessel Measurement Sparger to End Plate Jacking Bolts (two spargers only) T-Box to Sparger Welds Wear was noted in several locations. (details can be provided if requested).
	2009	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications
		EVT-1/ VT-3	Performed EVT-1/VT-3 of Bracket Welds at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no indications Implemented a FW Sparger Modification to repair the indications noted in 2007. This modification was to re-install the preload on the spargers @ 225° and 315°.
		VT-1	Performed VT-1 on FW Brackets @ 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - wear was identified on the 264° 276°, and 354°.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2012	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.
		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
	2016	VT-1	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications.

		VT-3	Performed VT-3 of Bracket at 6°, 84°, 96°, 174°, 186°, 264°, 276°, and 354° - no change in wear on brackets.
		VT-1	Performed VT-1 on the T-Box to Sparger welds @ 45°, 135°. 225°, and 315° - no indications.
		VT-1	Performed visual examination of the flow holes on the T-Box and Spargers.
Steam Dryer	2003	VT-1/3	Inspect per GE SIL644. Indications in Upper Support Ring, Drain Channels, and Access Openings- all indications evaluated "use as is".
	2005	VT-1/3	Inspect per GE SIL644 Rev 1. Indications in Drain Channels and Upper Support Ring – all indications evaluated "use-as-is". No change in previous indications.
	2007	VT-1	Inspected per BWRVIP-139 (all exterior locations) Indications in Drain Channels, Access Openings and Upper Support Ring. All indications evaluated "use-as-is" for one cycle. Some of the previous indications could not be located and some new indication were identified. (Details can be provided if requested.)
	2009	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). All previously identified indications were noted as "No change". Three new indications were identified. 1) Upper Guide Bracket was observed to have a rolled piece of metal extending out and below the face/corner of the guide channel. 2) Middle weld on Tie Bar #4 was found cracked, and 3) Lower guide bracket, 180° side was found bent. All indications were determined to be acceptable.
	2010	VT-1 (89)	Performed examinations per BWRVIP-139 (all exterior locations). Two previously identified indications were noted as NRI, all others were "No change". Three new indications were identified on access hole

			cover. All indications were determined to be acceptable. Repairs made to Tie bars 3, 4, and 7 and to the rolled metal on the upper guide found during previous outage.
	2012	N/A	No inspections
	2014	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
	2016	VT-1 (89)	Performed VT-1 (89) of previously identified indications on the Drain Channel Welds, Upper Support Ring, and Access Opening - it was determined that there has been no significant change in these indications.
Dissimilar Metal Weld	2009	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on four (4) Category C, seven (7) Category D and two (2) Category E dissimilar metal welds.
	2010	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on ten (10) Category C, fifteen (15) Category D and two (2) Category E dissimilar metal welds. One category C weld had relevant indications. This was repaired by a weld overlay during the outage.
	2012	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on one (1) Category C dissimilar metal weld – no indications.
	2014	UT	ASME Section XI, Appendix VIII, Supplement 10 manual exams performed on three (3) Category C and four (4) Category D dissimilar metal welds – no indications.

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.
	Fall 2016 RF20	UT	Examined 100% accessible regions of H-3, 4, 5, 7. Found 5 indications in H4, all less than 3 inches length, less than 17% thru wall, 1.93% of examined length. Found 1 indication in upper side H5, 5.96 inches in length, depth 15%, 1.39% of examined length. Examined portions of H4 and H7 for off-axis indications in accordance with VIP interim guidance. 2 minor indications identified on H4, both less than 2 inches in length, depth less than 15% thru wall. Re-inspection scheduled for 10 years in accordance with BWRVIP-76 and VIP interim guidance.
Shroud Support	Spring 1994 RF06	VT-3	Examined 6 shroud support pillars 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 RF16	VT-3	Examined annulus surface. No issues or FME found.
	Spring 2012 RF17	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	Examined annulus surface, FOSAR, recovered 5 Powerfect nuts.
		EVT-1	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.
	Spring 2015 RF19	EVT-1	Examined flat access hole cover. No indications.
		EVT-1	Examined top hat access hole cover. Examined 77.78% circumferentially of vertical weld, 24.2% has signs of indications.
	Fall 2016 RF20	VT-3	Examined annulus surface. No issues or FME found.
		VT-3	Examined annulus surface. No issues found. Identified FME removed from the vessel.
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	Examined all creviced and non-creviced weld locations, no indications

		VT-1	Examined all (8) header brackets, no new indications.
	Spring 1999 RF08	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no new indications.
	Spring 2000 RF09	EVT-1	Examined all creviced weld locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Fall 2001 RF10	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		VT-1 & 3	Examined 25% header brackets, no indications.
	Spring 2003 RF11	EVT-1	Examined all creviced weld locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2004 RF12	EVT-1	Examined all creviced and 25% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2006 RF13	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
	Fall 2007 RF14	UT & EVT-1	Examined all creviced and 100% non-creviced locations, no indications.
		EVT-1 & VT-3	Examined 25% header brackets, no new indications.
	Spring 2009 RF15	EVT-1	Examined all locations that could not be UT examined in the previous outage, no indications.
		EVT-1 & VT-3	Examined 25% header brackets. No indications.
	Fall 2010 RF16	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.

	Spring 2012 RF17	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.
	Spring 2015 RF19	EVT-1 EVT-1 & VT-3	Examined all creviced weld locations, no indications Examined 25% header brackets, no indications.
	Fall 2016 RF20	EVT-1 EVT-1 & VT-3	Examined 'B' loop piping elbows (P4a-d), 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 RF16	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 RF16	EVT-1	Examined 4 top guide grid beam locations. No indications.
	Spring 2012 RF17	EVT-1	Examined 2 top guide grid beam locations. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 top guide grid beam locations. No indications. SRM plunger tip was not fully seated but was reseated into the receptacle.
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	50% riser braces (RB-1/2 & RS-8/9), 100% RS-1, no indications

		VT-1	100% sensing lines. Three pumps have cracked standoffs, installed clamps.
		VT-3	100% beams, no indications
		VT-3	100% wedges and setscrews. 1 screw with 1 tack cracked
	Spring 1999 RF08	EVT-1	50% riser brace(RB-1/2 & RS-8/9), no indications
		EVT-1	100% RS-1, no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% beams, 100% wedges and setscrews, no indications
	Spring 2000 RF09	EVT-1	50% riser brace (RB-1/2 & RS-8/9), no indications
		VT-1	100% sensing lines, no indications
		VT-3	100% wedges and setscrews, no indications
	Fall 2001 RF10	VT-1	100% sensing lines, no indications
		VT-3	100% wedges
	Spring 2003 RF11	VT-1	100% wedges, no movement noted
		EVT-1	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
		VT-1	50% sensing lines, no indications
	Fall 2004 RF12	UT	100% beams, BB1/2, no indications
		VT-1	50% sensing lines, no indications
		EVT-1	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	50% sensing lines, no indications
		VT-1	100% wedges, one had minor wedge wear, installed slip joint clamp
		EVT-1	25% RB-1/2, 25% RS-8/9, no indications
	Fall 2007 RF14	VT-1	100% wedges, one had minor wedge wear and SS setscrew gap of 35 mil, installed auxiliary wedge
		VT-1	1 slip joint clamp, no issues
		VT-1	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 VT-3 VT-1 VT-3 EVT-1	100% wedges, no wear found. Slip joint clamp and aux wedge. No issues found. 11 sensing lines. No indications. Installed aux wedge for an issue found previous outage. 50% RS3, no indications.
	Fall 2010 RF16	EVT-1 VT-1 VT-3	100% RS-8/9 and 25% RS-6/7. No indications 50% wedges. No new wear found. 3 sensing line clamps and 1 aux wedge. No issue found.
	Spring 2012 R17	EVT-1& VT-1 VT-1 EVT-1	25% inlet/mixer and diffuser welds (IN4, MX2, DF1/2, AD1/2). No issues found. 3 riser brace welds. No issues found. 50% wedges. No new wear found. 3 RS-1 and RS-2. No issues found.
	Fall 2013 RF18	UT VT-1 VT-1	100% beams, no indications 3 sensing line lower bracket, no indications 6 known setscrews tack cracks. 3 confirmed no growth, 3 no indication.
	Spring 2015 RF19	VT-1 VT-1 VT-3 VT-3 VT-3 EVT-1 EVT-1 & VT-1	50% wedges and rods. No new wear found. 14 sensing line support brackets. No indications. 3 sensing line clamps. No indications. 1 Slip joint clamp. No indications. 2 Aux wedges. No indications. 50% RS-3 Riser to Transition. No indications. 2 Riser Braces, RB-1 & RB-2. No indications.
	Fall 2016 RF20	EVT-1	Examined 3 restrainer bracket to riser pipe welds, RS-6 and RS-7, and 3 riser brace to riser pipe welds, RS-8 and RS-9, no indications.

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 VT-3	Below Core Plate Inspection Examined 100% of CRGT-2 & CRGT-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	VT-1	Examined IAW SIL 409. No indications found.
	Spring 1999 RF08	EVT-1	All 12 dry tubes had circumferential cracking approx 1 inch below the upper collar
	Spring 2000 RF09		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	VT-1	50% jet pump riser bracket, no indications
	Fall 1997 RF07	VT-1 VT-3	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

	Spring 1999 RF08	VT-1	25% core spray header bracket, 100% feedwater sparger bracket, 100% steam dryer support bracket, no indications.
		EVT-1	50% jet pump riser bracket, no indications
		VT-3	100% guide rod bracket, no indications
	Spring 2000 RF09	VT-1	25% core spray header bracket, no indications
		EVT-1	50% jet pump riser bracket, no indications
	Fall 2001 RF10	VT-1	25% core spray header bracket, no indications
		VT-3	100% guide rods, no indications
	Spring 2003 RF11	EVT-1	25% core spray header bracket, no indications
	Fall 2004 RF12	EVT-1	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 EVT-1 & VT-1	25% core spray header brackets. 100% feedwater brackets. Found minor pin wear on 2 pins. Evaluation justified operation for one cycle.
	Fall 2010 RF16	EVT-1 VT-1	25% core spray header brackets. 2 Feedwater bracket pins where wear previously found. No discernable change.
	Spring 2012 RF17	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 VT-1 VT-3	25% core spray header brackets and 4 jet pump riser braces. No issues found. Examined 120deg surveillance capsule assembly.
	Spring 2015 RF19	EVT-1 & VT-1	2 jet pump riser brace arm. No indications.
		EVT-1 & VT-3	25% core spray header brackets.
		EVT-1 & VT-3	100% steam dryer support bracket to RPV. No indications.
		VT-3	2 guide rod flange & brackets. No indications.
		VT-3	100% feedwater sparger vessel attachments. No indications.
		VT-3	2 Feedwater bracket pins where wear previously found. No additional wear.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
LPCI Coupling	Fall 2001 RF10	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2003 RF11	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2006 RF13	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2012 RF17	EVT-1 VT-1 VT-3	Examined 50% couplings, no indications
	Spring 2015 RF19	EVT-1 VT-1 VT-3	Examined 50% couplings. Two indications on the shroud attachment ring, ~.88" & 1".

		EVT-1	Expanded scope to include same location on balance of couplings. No indications.
	Fall 2016 RF20	EVT-1 & VT-3	Examined 25% Core Spray header brackets, no indications.
		VT-1	Examined 100% of surveillance sample brackets, no indications.
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	100% drain channels, one indication identified on skirt below a seismic lug access plate weld, 0.75"
		VT-1	100% support ring, no new indications, no growth on previous indication
	Spring 2003 RF11	VT-1	100% support ring, no new indications, no growth on previous indication
		EVT-1	Re-look at skirt indication, no growth
		EVT-1	Manway cover plate
		VT-1	100% cover plates
		VT-3	100% tie bars
		VT-1	100% lifting lug braces, one found severed.
	Fall 2004 RF12	VT-1	100% support ring, no growth on previous indication, new indication identified; 0.625" across top, and 0.75" down face.
		VT-1	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	Previously identified indications on support ring, no growth found.
		VT-1	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 crater crack found on a lifting rod bracket weld. All indications were evaluated for use as is. No repairs required.
	Fall 2010 RF16	VT-1	2nd re-baseline IAW BWRVIP-139 following EPU 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 RF17	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.
	Spring 2015 RF19	EVT-1 & VT-3	100% Support bracket to RPV. No indications.
		VT-1	Examined known flaw for growth. No growth observed.
	Fall 2016 RF20	VT-1	Examined 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 RF16	UT	Examined 5 category C welds after weld crown reduction; 2 by auto, 3 by manual. No indications found.
	Spring 2012 RF17	UT	Examined 1 category E weld by manual UT.
	Fall 2013 RF18	A-UT	Examined 3 category C welds with automated UT. No growth of known embedded flaws, no new indications.
	Fall 2016 RF20	A-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)
	Spring 2015 RF19	VT-3	Examined eight shroud head bolts, including pin area. No indications.
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.
Capsule	Spring 1994 Spring 2015 RF19		Removed 30 degree capsule. Removed 120 degree capsule per EPRI ISP program.

Reactor Internals Inspection History

Plant: **Oyster Creek Generating Station**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Steam Dryer	Fall 2016	Visual	VT-1 of all high stress (red) locations and 10% of green locations. A total of 81 locations were inspected. EVT-1 of all 4 Hold Down Assemblies and all 4 Dryer Lifting Rods. Re-inspected previous Steam Dryer indications and repair areas. Evaluated indication areas with no change and areas with minor change as acceptable as is. New indications on tie bars TB-F measured 1.3" and TB-I ~ ¼". Indications on drain channels welds V07 ID &V15 ID and Jacking Bolt at 50 degrees are new or showing growth or changes from the previous examinations. These indications are acceptable until 2020 which is after plant shutdown.
	Fall 2014	Visual	Re-inspected 2 Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2012	Visual	Re-inspected Steam Dryer indications and repair areas, including indications on the ID, identified during previous outages. Evaluated indication areas with no change and areas with minor change to use-as-is for one cycle.
	Fall 2010	Visual	Re-inspected Steam Dryer indications and repair areas identified during previous outages and evaluated due to no change to use-as-is for one cycle.
	Fall 2008	Visual	Completed BWRVIP-139 required inspections of the ID of the dryer using GEH Firefly ROV. Identified 2 areas of fatigue cracking in drain channels and 1 area of fatigue cracking in support beam to mid-support ring weld.

			Evaluated as use-as-is for one cycle in accordance with BWRVIP-139 generic flaw evaluation. Re-inspected Steam Dryer indications and repair areas identified during previous outages. Tie bar N-1 lower repair area was found degraded and GEH issued JCO for one cycle of operation.
	Fall 2006	Visual	Re-inspect Steam Dryer Indications identified during previous outages. EVT-1 cracks in hold-down area from 1R19. VT-1 all 4 lifting lugs and EVT-1 indications on 135 deg. lug. BWRVIP-139 required inspections (top side) completed. New fatigue indications were identified that required repair. Dryer repair project completed with 2 areas stop drilled and one crack in center baffle plate was cut out.
Core Shroud	Fall 2016	VT-3	VT-3 of Tie-Rods at 10 deg and 70 deg. No findings Re-inspection of two horizontal indications on vertical weld V-9. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. No changes in the end points from 2006. These conditions are acceptable for ten years.
	Fall 2014	VT-3	VT-3 of 5 Tie-Rods at 100, 130, 160, 280 and 350 deg. locations. No findings.
	Fall 2012	VT-3	VT-3 of 3 Tie-Rods at 170, 220 and 310 deg. Locations. No findings.

	Fall 2010	VT-3	VT-3 of 2 Tie-Rods at 10 and 70 deg. Locations (#2 and #8). No findings.
	Fall 2008	UT / EVT-1	UT / EVT-1 inspection completed for all 10 shroud vertical welds. One indication found with UT in V10 weld – 1.76 inches long with depth of 0.47 inches. A technical evaluation was completed to use-as-is.
		VT-3	VT-3 Tie-Rods at 100 deg, 130 deg, 160 deg, 280 deg, and 350 deg. No findings.
	Fall 2006	EVT-1	V-9 inspection of ID and OD. Two horizontal indications (transverse to the weld) were found adjacent to vertical weld on the ID surface. The indications were 2.75 and 1 inch in length and 30 and 35 inches above horizontal weld H5. A technical evaluation was completed to use-as-is.
			VT-3 Tie-Rods at 170 deg, 220 deg and 310 deg. No findings. VT-1 of Upper Bracket to Shroud Ledge interface on all 10 Tie Rods. No findings.
	Fall 2004	None	No Examinations Required.
	Fall 2002	None	No Examinations Required.
	Fall 2000	EVT-1	V-3, V-4, V-15 and V-16. This was a one sided exam from the OD. No findings.
	Fall 1998	UT EVT-1	V-7, V-8, V-10 and V-12. V-11 I.D. Seven tie-rod assemblies baseline inspected.
			V-10 exhibited minor OD cracking away from the heat-affected zone. This cracking is believed to be associated with handling lugs that were welded during construction and removed after installation. All other inspected vertical welds were found free of indications. With the inspections

			performed in 16R and 17R, all accessible vertical welds in the shroud core region are complete. The following vertical welds could not be located. V-3, V-4, V-15 and V-16.
	Fall 1996	Visual	Inspected per BWRVIP-07. Three of ten tie rods inspected, no change from installation. EVT-1, OD of V-9 and V-11, (120" total). V-9 exhibited 3 small axial cracks in HAZ on the OD totaling 1.75". The ID of V-9 was free of axial cracks. A number of small transverse cracks were found on the OD and ID of V-9. V-11 was free of any indications. Analysis showed structural margin maintained.
	Fall 1994	Ultrasonic and visual	Inspected per BWRVIP-01 and 03. Cracks were detected in the Shroud welds H2, H4, H6A, and H6B. Lack of fusion was detected in H3 weld and visual cracks on the ID surface. The Tie Rod modification was installed. Base line visual performed of the tie rods.
Shroud Support	Fall 2016	EVT-1	EVT-1 of (2) of the 36 Lug / Clevis pin assemblies - #02 and #08. No findings.
	Fall 2014	Visual	EVT-1 of 5 of the 36 Lug / Clevis pin assemblies - #11, #14, #17, #29 and #36. No findings.
	Fall 2012	UT, EVT-1, VT-3	EVT-1 of 11 of the 36 Lug / Clevis pin assemblies - #5, #6, #12, #13, #18, #22, #23, #25, #31, #32 and #35. No findings. UT of H-9 from the OD (Drywell). Inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found "no change" in the 4" long indication in the N1E nozzle area. No other findings. VT-3 of 360 deg. (100%) of top of H9 weld. No findings.

	Fall 2010	Visual	EVT-1 of 6 of the 36 Lug / Clevis pin assemblies - #1, #2, #7, #8, #20 and #21. No findings.
	Fall 2008	Visual	EVT-1 of 8 Lug / Clevis pin assemblies - #10, #11, #14, #15, #17, #29, #30, and #36. No findings.
	Fall 2006	Visual	EVT-1 of 7 Lug / Clevis pin assemblies - #1, #18, #19, #23, #24, #32 and #33.
	Fall 2004	None	No examinations required.
	Fall 2002	UT	30% UT of H-9 from the OD (Drywell). UT inspected H-9 weld in Nozzle N1A, N1C and N1E bioshield openings. Found one 4" long indication in the N1E nozzle area. This "service induced" indication is in the bottom side of the H9 weld and does not penetrate into the base metal of the RPV.
	Fall 2000	Visual	25% of H-9, cleaning performed and EVT-1 inspection completed. This completes 100% inspection of the H-9 weld. No findings.
	Fall 1998	Visual	25% of H-9, cleaning performed and enhanced VT-1, no findings
	Fall 1996	Visual	25% of H-9, (different area then the 1994 inspection), cleaning performed and enhanced VT-1, no findings.
	Fall 1994	Visual	25% of H-9 cleaning performed and enchanted VT-1, no findings.
Core Spray Piping	Fall 2016	Visual	EVT-1 of all 10 annulus piping fillet welds. No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD,

			P4gD, P4hD, P3aB, P3bB and P4dB. No findings.
	Fall 2014	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings.
	Fall 2012	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 16.5 deg. No findings. EVT-1 of 25% sample butt welds: P4dA, P4eA, P4fA, P4iA, P4bB, P4cB, P4eB, P4fB, P4gB, and P4hB. No findings.
	Fall 2010	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 285 deg. No findings. EVT-1 of 25% sample butt welds: P4aA, P4g/aA, P3aC, P3bC, P4dC, P4eC, P4fC, P4aB, P3aD, and P3bD. No findings.
	Fall 2008	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 195 deg. No findings. EVT-1 of 25% sample butt welds: P3aA, P3bA, P2B, P4dD, P4eD, P4fD, P4gD, P4hD, P3aB, P3bB, and P4dB. No findings.
	Fall 2006	Visual	EVT-1 of annulus piping fillet welds (all 10). No findings. EVT-1 of 25% shroud attachment welds - Pipe Bracket PB 103.5 deg. No findings.

			EVT-1 of 25% sample butt welds: P4bA, P4cA, P2A, P4g/aA, P4g/bA, P4hA, P4iC, P4g/aC, P4g/bC, P4hC, P4bB, P4eB, P4fB, P4gB and P4hB. No findings.
	Fall 2004	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L-3, L-3A, L-4, L-20A, L-13A, L-5, L-7, L-8, L-10, L-11, and L-12 • U-3, U-3A, U-4, U-15A, U-24A, U-7, U-8, U-9, U-10, U-11, U-12, U-16, and U-17 100% of annulus pipe brackets at 15°, 105°, 195° and 285°. No findings. EVT-1 of all creviced welds in the annulus piping = U3, U3A, U4, U15A + U24A; L3, L3A, L4, L13A + L20A.
	Fall 2002	Visual	EVT-1 of a 25% sample (11 welds) of the butt welds (non-creviced) not inspected in 17R or 18R: • U1,U15,U17,U18,U19,U20 • L1,L9,L13,L16,L20 Inspect 100% of annulus pipe brackets (15°, 105°, 195° and 285°) No Findings.
	Fall 2000	Visual	Accessible portions of the annulus piping welds were cleaned using a nylon brush and visual inspections performed utilizing the EVT-1 technique. All accessible portions of the following piping welds were visually inspected: • L3, L3A, L4, L6, L13A, L14, L15 and L20A • U3, U3A, U4, U7, U8 and U15A 100% of annulus pipe brackets 15°, 105° 195° and 285°. No findings.

	Fall 1998	Visual	All creviced welds in the annulus piping; sample (25%) of the non-creviced welds in the annulus piping: • L2, L9, L10, L11, L12, L13, L17, L18, L19 and L20 • U2, U5, U6, U13, U14, U15, U21, U22, U23 and U24 Sample (25%) of pipe brackets 285°, 195°
	Fall 1996	Visual	Inspected per BWRVIP- 03. Cleaning of all accessible weld/HAZ surface and performed enhanced VT-1. No findings.
	Fall 1994	Visual and air test	Inspected VT-1, (1 mil wire). No change to pinhole weld defect detected in slip joint in 1992. Note: Pinhole weld defect detected in 1992 in System I. Analysis showed structural margin maintained
Core Spray Sparger	Fall 2016	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings except some rolled material noted on the CS SB 271 deg at the middle bracket sparger B contact point. This wear is not in a weld or HAZ of a weld. Inspected all ten sparger repair clamps. No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings.

	Fall 2014	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C & D. No findings. VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2012	Visual	EVT-1 Sparger Pipe End Cap welds S4A - 60 deg., S4A - 240 deg., S4B - 60 deg., and S4B - 240 deg. No findings. EVT-1 "T" box cover plate welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – A & B (CASS). No findings. VT-1 of 50% of the sparger bracket welds – SB-055 deg., SB-065 deg., SB-150 deg., SB-208 deg., SB-235 deg., SB-271 deg., and SB-330 deg. No findings. Inspected all 10 sparger repair clamps. No findings.
	Fall 2010	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 62 deg., S4C - 238 deg., S4D - 62 deg., and S4D - 238 deg. No findings. EVT-1 "T" box cover plate welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c – C and D (CASS). No findings.

			VT-1 of 50% of the sparger bracket welds – SB-026 deg., SB-091 deg., SB-120 deg., SB-179 deg., SB-245 deg., SB-300 deg., and SB-359 deg. No findings.
	Fall 2008	Visual	EVT-1 Sparger Pipe End Cap welds: S4A – 60 deg., S4A – 240 deg., S4B – 60 deg., S4B – 240 deg. No findings. EVT-1 "T" box welds - S1A, S2A (LH), S2A (RH), S1B, S2B (LH) and S2B (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-C. No findings. VT-1 of 50% of the sparger bracket welds – SB – 055, 065, 150, 208, 235, 271 and 330 deg. No findings.
	Fall 2006	Visual	EVT-1 Sparger Pipe End Cap welds S4C - 60 deg., S4C - 240 deg., S4D - 60 deg., and S4D - 240 deg. No findings. EVT-1 "T" box welds - S1C, S2C (LH), S2C (RH), S1D, S2D (LH) and S2D (RH). No findings. VT-1 spray nozzles - S3a, S3b, S3c-B. No findings. VT-1 of 50% of the sparger bracket welds – SB – 026, 091, 120, 179, 240, 300, and 359 deg. No findings.
	Fall 2004	Visual	Inspected all sparger repair clamps. No findings. Inspected end cap welds S4A-60, S4A-240, S4B-60, and S4B-240. No findings. Inspected sparger brackets SB-055, 065, 150, 208, 235, 271 and 330. No findings
	Fall 2002	Visual and Air Test	VT-1 all spargers, nozzles, end cap welds and repair clamps. No findings. No new leaks were identified during the Air Test.

	Fall 2000	Visual and Air Test	All sparger end cap welds were cleaned and EVT-1 inspected. No findings. VT-1 of spargers, repair clamps, and nozzles. No findings. No new leaks were identified during the Air Test.
	Fall 1998	Visual and Air Test	All sparger repair clamps, both spargers.
	Fall 1996	Visual and air test	Inspected per BWRVIP-03. Cleaned end cap welds and performed enhanced VT-1. No findings. Tee box welds are clamped and not accessible to clean or visual. Performed VT-1, (1 mil wire), of sparger piping and nozzles. No findings.
	Fall 1994	Visual and Air Test	Performed VT-1, (1 mil wire) of sparger piping and nozzles. No findings.
	1978 - 1980	Visual	(2) Cracks in sparger piping. Repair clamps installed. Note: Cracking found in sparger in 1978; repaired with clamps. Sparger has been inspected and air tested every outage since then; report submitted to NRC for approval for restart every outage.
Top Guide	Fall 2016	Visual	EVT-1 of previous top guide grid beams indications. The largest indication was measured from cell 43-44 at 3.875". Three indications that were measured in 2010 had longer lengths in the 2016 examination (slight growth less than an inch). The indications are acceptable as is for 4 years. VT-1 of two Hold Down Bolts (33 and 213 deg). No findings.
	Fall 2014	None	No inspection required this outage.
	Fall 2012	Visual	VT-1 of 2 hold-down bolts at 123 deg. and 303 deg. No findings.

	Fall 2010	Visual	EVT-1 Inspection and Measurement of 3 Cracks in Grid Beams (#4, VT-3 & VT-6). Some crack growth was observed. Flaw evaluation completed to support use as is. BWRVIP-183: Inspect 5% = 7 cells. No findings.
	Fall 2008	None	Not required for this outage by analysis.
	Fall 2006	Visual	EVT-1 of selected known flaws in grid beams: #4, VT-3 and VT-6. One area showed no growth, while the other two had grown between 0.25" and 0.75" from the 2002 outage to the 2006 outage. A flaw evaluation was performed to use-as-is.
	Fall 2004	Visual	VT-1 of top guide hold down bolts at 303 and 123 degrees. No findings. EVT-1 of VT-6 crack showed no measurable growth. Could not visually locate two other existing UT indications.
	Fall 2002	Visual	EVT-1 of two existing cracks measured in 18R outage (#3 and #5). No change to crack length identified.
	Fall 2000	Visual	Top guide hold down bolt assembly VT-3 at 33° and 213°. Top guide beam to rim fillet welds VT-1 at 33° and 213°. No findings. VT-1 of two existing cracks (#3 and #5) with cleaning. Both cracks measured on both sides. Crack #5 showed approx. 1" growth. Crack #3 showed no measurable growth.
	Fall 1998	None	Not required for this outage by analysis.
	Fall 1996	Ultrasonic 100% grid beams	12 indications emanating from notches detected at intersections of cross members. 5 of the 6 cracks on bottom

			side of member at mid-span detected. Removed sample from beam with crack to investigate root case.
	Fall 1994	Visual	[Under side of Top Guide] Three additional vertical cracks were detected at mid-span locations. Disposition use as is.
	Fall 1992	Visual	[Under side of Top Guide] Two additional vertical cracks were detected at mid-span location. Disposition use as is.
	Fall 1991	Visual	[Under side of Top Guide] A vertical crack was detected at mid-span location. Disposition use as is.
Core Plate	Fall 2016	None	No exams were required.
	Fall 2014	None	No exams were required.
	Fall 2012	None	No exams were required.
	Fall 2010	Visual	VT-1 inspected 3 In-core guide tube plugs 28-45, 44-13 and 44-21. No findings.
	Fall 2008	Visual	Visually inspected core plate wedges at 96° and 276° azimuths. No findings.
	Fall 2006	None	No exams were required.
	Fall 2004	Visual	No wedge inspections required. Inspected in-core guide tube plugs 04-29, 20-37, and 12-21. No findings.
	Fall 2002	Visual	No inspections needed. Wedges replace hold down bolt inspections.
	Fall 2000	Visual	Visually inspected all 8 wedges to verify integrity after first cycle of operation. All wedges found as installed.
	Fall 1998	Visual	Wedges installed. No further exams of core plate were performed.

	Fall 1996	Visual	Inspected top portion only of 18 hold down bolt that were not inspected in fall 1994 and top periphery section at bolt locations. No findings.
	Fall 1994	Visual	Inspected 18 hold down bolt tops only and top periphery at bolt locations inspected. No findings.
Jet Pump Assembly	N/A	N/A	N/A
Jet Pump Diffuser	N/A	N/A	N/A
SLC	Fall 2016	UT	UT examined the N12 liquid poison nozzle DM weld. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	PT	PT of Liquid Poison Nozzle to Safe End Weld. No findings.
	Fall 2010	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2008	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2006	UT	PDI - UT the Liquid Poison Nozzle N12 / SE. No findings.
	Fall 2004	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 2002	Visual / PT	PT of Liquid Poison Nozzle – No Indications. Inspect insulated nozzle from drywell during RPV pressure test. No leakage observed.
	Fall 2000	VT-2 pressure test	Inspected insulated nozzle from drywell. No leakage observed.
	Fall 1998	VT-2 during Code pressure test.	Not made accessible for direct exam.
	Fall 1996	None	Not made accessible.

	Fall 1994	None	Not made accessible.
CRD Guide Tube	Fall 2016	None	Not required and not made accessible.
	Fall 2014	None	Not required and not made accessible.
	Fall 2012	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 1 guide tube base for CASS (VT-1). No findings
	Fall 2010	EVT-1, VT-3	Inspected 2 guide tubes. Inspected 2 guide tube bases for CASS (VT-1). No findings.
	Fall 2008	None	Not required and not made accessible.
	Fall 2006	EVT-1, VT-3	Inspected 4 guide tubes. No findings.
	Fall 2004	EVT-1, VT-3	Inspected 4 guide tubes. No Findings.
	Fall 2002	EVT-1, VT-3	Inspect 1 guide tube (46-43) removed to support stub tube inspection. No findings.
	Fall 2000	VT-1, VT-3	2 guide tubes. No findings.
	Fall 1998	VT-3	15, no findings.
	Fall 1996	No inspection Performed.	Not made accessible.
	Fall 1994	No Inspection Performed	Not made accessible.
CRD Stub Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.
	Fall 2010	None	No inspections required.
	Fall 2008	None	No inspections required.
	Fall 2006	None	No inspections required.
	Fall 2004	None	No inspections required.

	Fall 2002	VT-1	Visual Inspection of 2 stub tubes found leaking at bottom head in Fall 2000 (42-43 and 46-39). No indications noted.
	Fall 2000	VT-1 VT-2 pressure test	None made accessible. 2 stub tubes found leaking at bottom head (42-43 and 46-39). Performed UT of CRD housing to stub tube welds (J weld) and area of housing to be rolled. No indications. Roll repaired both leaking housings.
	Fall 1998 Fall 1996 Fall 1994	No inspection Performed.	Not made accessible.
In-Core Housing	Fall 2016	None	Not made accessible.
	Fall 2014	None	Not made accessible.
	Fall 2012	None	Not made accessible.
	Fall 2010	None	Not made accessible.
	Fall 2008	None	Not made accessible.
	Fall 2006	None	Not made accessible.
	Fall 2004	None	Not made accessible.
	Fall 2002	None	Not made accessible.
	Fall 2000	None	Not made accessible.
	Fall 1998 Fall 1996 Fall 1994	No inspection performed.	Not made accessible.
Dry Tube	Fall 2016	None	No inspections required.
	Fall 2014	None	No inspections required.
	Fall 2012	None	No inspections required.

	Fall 2010	Replacement	Replaced final 4 Dry tubes due to service life: IRM-15 and 16; SRM 22 and 23.
	Fall 2008	Replacement	Replaced 4 Dry tubes due to service life: IRM-12, 13, 14 and SRM-21.
	Fall 2006	Replacement	Replaced 4 Dry tubes due to service life: IRM-11, 17, 18 and SRM-24.
	Fall 2004	Visual	VT-1 of SRM 24 found tube not fully engaged in top guide. VT-1 of IRM 17 and IRM 18 found both tubes bowed.
	Fall 2002	Visual	No inspections required.
	Fall 2000	Visual	VT-1 five dry tubes. One found slightly bent – use as is. No findings on others.
	Fall 1998	Visual	VT-1 one dry tube, no findings
	Fall 1996	Visual	VT-1 one dry tube, no findings.
	Fall 1994	Visual	VT-1 four dry tubes, no findings.
Instrument Penetrations	Fall 2016 Fall 2014 Fall 2012 Fall 2010 Fall 2008 Fall 2006 Fall 2004 Fall 2002 Fall 2000 Fall 1998 Fall 1996 Fall 1994	Visual	VT-2 exam from vessel exterior. No findings.
Vessel ID Brackets	Fall 2016	VT-3	VT-3 of 2 guide rod wall brackets. No findings. VT-3 of 6 surveillance specimen brackets @ 30, 210 and 300 deg. No findings. VT-3 / VT-1 of all 4 Spargers and Nozzle Interface Areas. No changes in the indications for spargers at 45 and 135 deg.

	Fall 2014	EVT-1	Inspected all 4 dryer support brackets. Minor changes in wear patterns were evaluated for continued service.
	Fall 2012	None	No inspection required.
	Fall 2010	EVT-1	EVT-1 all feedwater sparger attachment wall bracket welds. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	EVT-1	EVT-1 both Guide Rod Brackets. EVT-1 all 3 Surveillance specimen brackets. No findings.
	Fall 2004	EVT-1	Inspected all 4 dryer support brackets. No findings.
	Fall 2002	EVT-1	All feedwater sparger attachment brackets. Both guide rod attachment brackets. All surveillance sample brackets (30, 210 and 300 degree locations) No indications on attachment welds.
	Fall 2000	EVT-1	All 4 dryer support brackets. Observed wear indications on brackets. No indications on attachment welds. All feedwater attachment brackets inspected. No indications on attachment welds. Cracks observed on feedwater sparger to end bracket welds (non-safety-related component) on 2 ends.
	Fall 1998 Fall 1996 Fall 1994	VT-1	VT-1 of accessible portions of weld on guide rod brackets, steam dryer brackets, surveillance sample brackets. All attachment welds; no findings.
LPCI Coupling	N/A	N/A	N/A
Fuel Support Casting	Fall 2016	Visual	VT-1 Inspection of 1 Fuel Support Casting Cell 26-47. No findings.
	Fall 2014	None	No inspections required.
	Fall 2012	Visual	VT-1 Inspection of 1 Fuel Support Casting. No findings.

	Fall 2010	Visual	VT-1 inspection of 2 CRGT Bases (support castings) for CASS program. No findings.
	Fall 2008	None	No inspection required.
	Fall 2006	None	None inspected.
	Fall 2004	None	None inspected.
	Fall 2002	None	None inspected.
	Fall 2000	Visual	VT-3 (2) support casting. No findings.
	Fall 1998	Visual	VT-3 (24) support castings. No findings.
	Fall 1996	Visual	VT-3 (25) support castings. No findings.
	Fall 1994	Visual	VT-3 (17) support castings. No finding
Reactor DM Welds (BWRVIP-75-A)	Fall 2014	UT - Auto	UT examined eight (8) dissimilar metal (DM) welds containing alloy 82/182. This included three (3) DM welds on the top head. No new findings identified.
	Fall 2012	UT - Auto	UT examined three (3) Category D nozzle to flange dissimilar metal (DM) welds containing alloy 82/182. No findings.
			UT examined one (1) Category C recirculation suction nozzle to safe end DM weld N1A. Found no change to previously identified flaw and updated the flaw evaluation for another 2 cycles.
	Fall 2010	UT - Auto	UT examined four (4) Category C nozzle to safe end dissimilar metal (DM) welds containing alloy 82/182. No findings.

	Fall 2008	UT – Auto	UT examined five (5) Category C nozzle to safe end dissimilar metal (DM) welds. One indication identified in N1A recirculation suction nozzle to safe end weld dispositioned as acceptable for 2 cycles in accordance with IWB-3600 flaw evaluation. The 0.21 inch ID connected indication was in the RPV nozzle to clad interface on the Reactor side of the Alloy 182 DM weld. The flaw evaluation was submitted to the NRC.

Note: All indications left "as is" were analyzed and structural margins were acceptable for continued service.

Reactor Internals Inspection History

Plant: **Peach Bottom Atomic Power Station, Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1994	UT & VT	Comprehensive UT Baseline of some Category "C" circumferential welds (H-2, H-3, H-4, and H-5) per BWRVIP-01, Rev. 0. Partial UT baseline of welds H-1, H-6, and H-7, w/ partial Enhanced VT-1 of H-6 OD. 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-6, and OD of H-4 and H-5. Full structural margins calculated using two cycles of crack growth for comprehensively examined welds, one cycle for welds with limited exams. No indications identified on H-2 and H-7.
	1996	UT	Comprehensive UT of welds H-1, H-6 and H-7 per BWRVIP-01, Rev. 1. Exams per BWRVIP-03. Indications identified on ID of welds H-1, H-6 and H-7, on OD of weld H-1. Full structural margins calculated using two cycles of crack growth. Reexaminations planned per BWRVIP-76
	2002	UT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76. Indications identified on each weld. UT of Vertical welds V-1 through V-4. No indications identified. Reexaminations scheduled per BWRVIP-76.
	2012	UT & VT	Comprehensive UT of welds H-1 through H-7 per BWRVIP-76, Rev. 1. Indications were identified on all horizontal welds. Horizontal welds H1, H2, H3 and H4

			were evaluated and found acceptable for continued service via a plant specific analysis performed by SIA. Horizontal welds H5, H6 and H7 were evaluated via Table 2-1 of BWRVIP-76. UT of vertical welds V-1 through V-8 were performed with one indication identified on the V-3 weld. The indication was determined to be acceptable for continued service. EVT-1 examinations were performed on the following: shroud ID of the H-4 weld at 045 degrees, the shroud ID intersection of the V-5 and H-4 welds at 090 degrees, shroud ID intersection of the V-6 and H-4 welds at 270 degrees. No indications were identified during the visual inspection of the core shroud.
Shroud Support	1992	VT-3	VT-3 examination of support leg stub welds. No indications identified. VT-3 examination of welds H-7, H-8, and shroud support cylinder. No indications identified.
	1994	VT-3	VT-3 of accessible portions of H-8 weld between Jet Pump #1 and #10. No indications identified.
		VT-1	VT-1 examination around perimeter of 0 deg. access hole cover. No indications identified.
		UT	UT examination of both access hole covers. No indications identified.
	1998	EVT-1	EVT-1 examination of both AHCs. No indications identified. EVT-1 of 10% of shroud support weld H-8, top side, no indications identified. EVT-1 of 10% of shroud support weld H-9, top side, no indications identified.
	2000	EVT-1	EVT-1 examination of both AHCs. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 0° and 180° Azimuth. No indications identified.

	2002	UT	UT of 10% of H-9 weld length from OD of vessel. No indications identified.
	2004	EVT-1	EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		VT-3	VT-3 of accessible portions of H-9 weld between 180° and 360°. No indications identified
	2008	EVT-1	EVT-1 examination of both AHCs. No indications identified.
	2010	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of > 10% of shroud support weld H-8, top side, between jet pumps 10 – 11 and 1 – 20. No indications identified.
		UT	BWRVIP-180 baseline UT exams were completed on both AHCs. No indications identified.
	2012	EVT-1	EVT-1 of the H-9 weld was performed on the 157.5°-202.5° and the 337.5°-022.5° degree segments of the weld. No indications were identified. Note: Examination coverage of the H-9 weld was greater than 10% of the weld.
	2016	EVT-1	EVT-1 was performed on both AHCs, no indications identified. EVT-1 of 10% of shroud support weld H-8, the 157.5 -202.5 deg and 337.5-022.5 deg segments of the weld. No indications identified.
Core Spray Piping	1980 to 1996	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.
	1996	VT-1 (1/2 mil)	EVT-1 (1/2 mil resolution) performed on annulus piping welds per BWRVIP-18. Cracking identified in "B" Header tee-box cover plate weld (P2B). UT performed to characterize indication.

			Evaluation demonstrated structural margin for one operating cycle
	1998	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique. EVT-1 used to supplement UT. No new indications identified. P2B weld reexamination yielded additional margin.
	2000	EVT-1	EVT-1 of nine (9) piping welds not previously UT'd, and of six (6) pipe brackets and attachment welds. No indications identified.
	2002	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (28 welds). EVT-1 used to supplement UT (6 welds). EVT-1 on two (2) support brackets. No new indications identified. P2B weld indication reexamination revealed minimal growth.
	2004	EVT-1	EVT-1 of twelve (12) piping welds not accessible for UT inspection. No indications identified
	2006	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). EVT-1 used to supplement all one-sided UT (12 welds). EVT-1 only on eight (8) pipe welds and six (6) support brackets. P2B weld indication reexamination revealed no growth. New 9/16" indication identified visually at intersection of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.
	2008	EVT-1	Re-inspection per BWRVIP-18, EVT-1 used on (21) pipe welds. P2B weld indication re-examination revealed no growth. The P3B1 9/16" indication revealed no growth. New indication (0.49") identified visually on the upper side of P3B1 and P2B welds. Structural and leakage evaluations found flaw acceptable for continued service.

	2010	EVT-1 & UT	Reinspection per BWRVIP-18, using UT technique (24 welds). Two sided UT performed on selected P4 elbow welds. EVT-1 used to supplement all one-sided UT on T-box welds (8 welds). P2B weld indication reexamination revealed no growth. P3B1 indications identified some change in measured size due to better cleaning and exam video resolution. . Structural and leakage evaluations found flaw acceptable for continued service.
	2012	EVT-1	EVT-1 examination of 17 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2014	EVT-1	EVT-1 examination of 33 pipe welds. The examinations re-identified indications on the P2B and P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for continued service. All other examinations identified no indications.
	2016	EVT-1	EVT-1 examination of (7) pipe welds. The examinations re-identified indications on the P3B1 weld, however, no growth from last outage. Structural and leakage evaluations found flaw acceptable for one cycle. All other examinations identified no indications.
Core Spray Sparger	1980 to 1994	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13, Cracking discovered at tee-box to sparger pipe weld ("B" Sparger, 1982), bolted repair clamp installed. No other indications identified.
	1998	VT-3 & MVT-1	Reinspections per BWRVIP-18, no indications identified.
	2000	EVT-1	EVT-1 of selected sparger welds per BWRVIP-18. No indications identified.

		VT-1	VT-1 of sparger tee-box repair clamp, and approx. 50% of sparger "C" and "D" nozzles and drains. VT-1 of eleven (11) sparger brackets and welds. No indications identified.
	2002	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of seven (7) sparger pipe welds. No indications identified.
	2004	VT-1, EVT-1	VT-1 of six (6) Sparger support bracket welds, one (1) sparger drain, and 50% of nozzles on spargers "C" and "D". EVT-1 of fifteen (15) Sparger pipe welds. No indications identified.
	2006	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2008	EVT-1, VT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. EVT-1 of ten (10) sparger pipe welds. No indications identified.
	2010	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp, and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
	2012	VT-1, EVT-1	VT-1 of six (6) sparger support brackets and 50% of sparger "C" and "D" nozzles and drains. One recordable indication was identified on sparger bracket 04. The indication was defined as deformation on the top, middle and lower brackets. The deformation was concluded to be minor and would not impact the ability of the bracket to support the sparger piping. EVT-1 of six (6) sparger pipe welds identified no indications.

	2014	VT-1, EVT-1	VT-1 of six (6) sparger support brackets, one (1) tee box repair clamp and 50% of sparger "A" and "B" nozzles and drains. EVT-1 of eight (8) sparger pipe welds. No indications identified.
Top Guide (Rim, etc.)	1976 to 1994	VT-3	VT-3 exam every other refueling outage per Section XI. No indications identified.
	1987	UT	UT examination performed of specific cells. No indications identified.
	1994	VT-3	Visual (VT-3) examination of 4 cells (48-41, 08-25, 24-17, and 24-25), per SIL 554. No indications identified.
	1996	VT-3	Visual (VT-3) of 2 aligner pins (0 deg. And 270 deg.), per SIL 588. No indications identified.
	2012	EVT-1	EVT-1 examinations were performed on nineteen (19) top guide cells in accordance with BWRVIP-183. No indications were identified.
Core Plate (Rim, etc.)	1996	VT-3	VT-3 examination of all accessible hold down bolts (cell 16-57, and area at 0 and 270 deg. Azimuth. No indications identified.
	2010	VT-3	VT-3 examination of 16 core plate plugs. No Indications identified.
	2012	VT-3	All 129 core plate plugs were replaced with the new design. VT-3 of nine (9) core plate bolts was performed. No indications were identified.
SLC	1992	PT	Surface (PT) examination of nozzle to safe end weld per Section XI. No indications identified.
	1998	PT & UT	PT and UT of N10 nozzle to safe-end, no indications identified.
	2002	PT	Extended dwell time Liquid Penetrant examination of entire safe end.

			No indications identified.
	2006	PT	Extended dwell time Liquid Penetrant examination of entire safe end. No indications identified
	2010	UT-E	SLC Nozzle to safe end weld. No indications identified.
Jet Pump Assembly	1976–1996	VT-3	Visual VT-3 of all jet pump components performed every other refueling outage.
	1981	VT & UT	VT and UT examination performed on all 20 hold down beams. No indications identified.
	1994	VT	Restrainer bracket wedge misalignment and wear identified on several wedges. Evaluations found condition acceptable without repair. One restrainer bracket set screw tack weld found cracked. Evaluations found condition acceptable without repair.
	1996	VT	Restrainer bracket wedge conditions and set screw tack welds remain unchanged, condition acceptable without repair.
	1998	MVT-1	MVT-1 of: RS-1 weld on all 10 risers, RS-2 & RS-3 welds on 6 of 10 risers. No indications identified.
		UT	UT of all 20 hold down beams. No indications identified.
	2000	EVT-1	EVT-1 of adjusting screw tack weld (jet pump 7) and RS-2 & RS-3 on 5 of 10 risers. No indications identified.
	2002	EVT-1	EVT-1 of fifty (50) Medium priority weld locations. EVT-1 of transition region of two (2) hold down beams. No indications identified
	2004	EVT-1	EVT-1 of forty one (41) medium priority welds, to complete 50% baseline inspections. No indications identified.

		UT	UT performed on all twenty (20) hold down beams (3 zones, BB-1, BB-2, and BB-3). No indications identified.
		VT-1	VT-1 on all twenty (20) Inlet Mixer main wedges. Thirteen (13) jet pumps exhibited additional wear at main wedge-to-restrainer bracket interface. Performed expanded scope of inspections on these jet pumps. Set screw gaps identified at five (5) jet pumps. No additional problems identified. Installed eight (8) slip joint clamps and three (3) set screw auxiliary spring wedges, to mitigate wear believed to be caused by vibration.
	2006	VT-1, EVT-1, VT-3	VT-1 of twenty (20) WD-1 locations. EVT-1 of five (5) IN-4 welds, and two (2) riser braces-to-vessel attachment welds. VT-3 of eight (8) Slip Joint Clamps and three (3) Auxiliary Spring Wedges. Expanded EVT-1 scope on three (3) jet pumps due to WD-1 findings.
	2008	UT	UT exams performed on all 20 jet pump hold down beams. No indications identified.
		VT-3	Visual inspections performed on 5 auxiliary spring wedges installed. No indications identified.
		EVT-1	EVT-1 of 50 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Expanded EVT-1 scope on one jet pump due to WD-1 findings.
		VT-1	VT-1 of twenty (20) WD-1 locations. Re-examined previously identified wedge wear with no apparent changes noted on 19 of 20 inspections. One main wedge had additional wear into the restrainer

			bracket. BWRVIP 41 expanded scope inspections were performed with no additional indications identified. One Slip joint clamp was installed on the affected Jet Pump.
	2010	VT-3	VT-3 of two slip joint clamps. No indications identified
		VT-1	VT-1 of all twenty (2) JP main wedges. No new/additional wear identified. VT-1 of all JP set screws for gaps. Minor gaps identified on seven JPs. Five (5) accepted for continued service by engineering analysis. Two (2) were corrected by tapping down on the main wedge.
		EVT-1	EVT-1 of 37 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser elbow to thermal sleeve, and riser elbow to riser pipe welds. No indications identified. Completed BWRVIP Letter 2009-202 required inspections.
	2012	VT-3	VT-3 of seven slip joint clamps. Minor wear detected on JP 15 slip joint clamp. Wear was acceptable for continued use and will be re-inspected next outage.
		VT-1	VT-1 of all twenty (20) JP main wedges. New wedge wear identified on JP 16 and accepted for continued use. New wedge rod wear identified and accepted for continued use on JPs 1, 2, 5, 10, 11, 12, 14, 17 and 20. VT-1 of three (3) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. VT-1 of set screw gaps were performed on seven (7) JPs. Five of the jet pumps had minor gaps which were acceptable for continued use by an engineering analysis.

		EVT-1	EVT-1 of 20 medium and high priority welds including; riser brace leaf to yoke welds, riser pipe to riser brace welds, riser pipe to transition piece weld, riser brace leaf to RPV Pad Weld, riser pipe to restrainer bracket circumferential weld and the bottom of the nozzle casting to the top of the mixer assembly weld (IN-4). No indications identified.
	2014	VT-3	VT-3 of nine (9) slip joint clamps. Minor wear detected on JP 05 and JP 15 slip joint clamps. Wear was acceptable for continued use and will be re-inspected next outage. New slip joint clamps were installed on JP 16 and JP 20 as a result of new wear on the belly band, and restrainer bracket.
		VT-1	VT-1 of all twenty (20) JP main wedges. Slight new wedge wear identified on JP 16 and accepted for continued use. The wedges on the bottom side on JPs 13 and 16 appeared to be lower. New wedge rod wear identified and accepted for continued use on JPs 06, 13 and 20.
		VT-1	VT-1 of eight (8) auxiliary wedges. Minor wear identified on two (2) aux wedges and accepted for continued use. The auxiliary wedges on JPs 10 and 18 were found in the over-travel and were replaced. The aux. wedge on JP20 was also found in the over-travel position and a slip join clamp was installed which resulted in no set screw gaps. Both aux wedges on the shroud side and vessel side on JP 20 were then removed.
		VT-1	VT-1 of set screw gaps were performed on jet pumps without a slip joint clamp or auxiliary wedge. All as-left gaps were acceptable for continued use and none exceeded the 0.010" criteria for installation of an auxiliary wedge.

	2016	VT-1	VT-1 of four (4) slip joint clamps. Minor wear detected on JP 05 SJC. Wear was acceptable for continued use.
		VT-1	VT-1 of (20) main wedges. New wedge rod wear identified on JP 03, 13 and 16 and accepted for continued use. The wedges on JPs 12, 14 and 20 appeared to be lowered.
		VT-3	VT-3 of three auxiliary wedges. Minor wear identified on JP 13 and 18 aux wedges and accepted for continued use.
		EVT-1	EVT-1 of 28 medium and high priority welds including riser pipe to riser brace welds, riser elbow to thermal sleeve, inlet and mixer connections, riser elbow to riser pipe welds etc. A 1 5/8" flaw was noted on JP11/12 RS-1 weld and was accepted as is with re-inspection next outage in 2018.
Jet Pump Diffuser	1998	MVT-1	MVT-1 of: AD-1 & AD-2 welds on 12 of 20 pumps, AD-3A & B welds on 11 of 20 pumps, and DF-2 weld on 10 of 20 pumps. No indications identified.
	2000	EVT-1	EVT-1 of AD-1, -2, -3a, -3b, and DF-2 on jet pumps 1 through 10. No indications identified.
	2002	EVT-1	EVT-1 of ten (10) High priority weld locations. No indications identified.
	2004	EVT-1	EVT-1 of eleven (11) medium priority weld locations, to complete 50% baseline inspections. No indications identified
	2006	UT	UT of ninety eight (98) Diffuser / Adapter welds and six (6) Inlet Mixer welds. One 2" indication found on DF-2 weld, JP 17. Structural and leakage evaluations found indication acceptable for continued service.

	2010	EVT-1	EVT-1 of JP 17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified.
	2012	EVT-1	EVT-1 of JP-17 DF-2 weld from the ID to look for any visual indication of the flaw identified by UT in 2006. 100% coverage of the ID was achieved, no indication was identified. This examination was a recommendation from the 2012 BWRVIP INPO review visit.
	2016	EVT-1	EVT-1 of (60) Diffuser / Adapter welds. Indications were identified on (11) Jet Pumps out of 20 AD-3a/b backing ring. Largest indication on JP03 ~3.6 inches. Indications were acceptable as is with re-inspection next outage.
		EVT-1	EVT-1 of JP-17 DF-2 weld from the OD to look for any visual indication of the flaw identified by UT in 2006. 40% coverage of the OD was achieved, all suspect areas were investigated and no indication was identified.
CRD Guide Tube	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified
	2002	EVT-1, VT-3	EVT-1 of three (3) welds on each of ten (10) Guide Tubes (locations 50-31, 42-11, 42-23, 42-51, 38-27, 38-35, 38-51, 34-23, 34-39, and 30-31). Some flow interference with examinations. VT-3 equivalent of anti-rotation pin on ten (10) Guide Tube locations. No indications identified
	2006	EVT-1, VT-3	EVT-1 of fifteen (15) CRGT welds, VT-3 of five (5) CRGT welds, verification of seventeen (17) CRGT alignment pins. One slightly bent pin identified. Pin remains functional. Condition found acceptable. No other indications identified.

	2008	EVT-1	EVT-1 of nine (9) CRGT welds. No indication identified. Also, verification of eight (8) CRGT welds and (8) CRGT alignment pins.
	2010	EVT-1	EVT-1 of four (4) CRGT welds. No indications identified. All BWRVIP-47 baseline examinations have been completed.
CRD Stub Tube	1992	VT-3	VT-3 examination of stub tube welds accessible from fuel cells 26-31 and 30-27. No indications identified.
In-Core Housing	1992	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
Dry Tube	1984		All Dry Tubes replaced in 1984
	1994	VT-1	VT-1 examination of IRM Dry Tube 2D, at core location 37-32.
	1997	N/A	All IRM and SRM tubes replaced w/ Wide Range Monitoring tubes in 1997. No inspections required.
	2016	N/A	The 1997 WRNM replacement left four dry tubes as spares, with no detector installed. All four spare dry tubes were replaced in 2016.
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.
LPCI Coupling			N/A for this plant
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 per ASME Section XI. No indications identified.
	2000	EVT-1	EVT-1 of six (6) Core Spray piping brackets. No indications identified.
	2002	EVT-1	EVT-1 of two (2) Core Spray piping brackets, two (2) Steam Dryer support

			brackets, and five (5) Jet Pump Riser brackets attachment welds. No indications identified.
	2004	EVT-1	EVT-1 of two (2) Steam Dryer support brackets and three (3) Jet Pump riser brace attachment welds.
		VT-3	VT-3 of four (4) Steam Dryer hold down brackets and three (3) lower surveillance brackets. No indications identified.
	2006	EVT-1, VT-3, VT-1	EVT-1 / VT-3 of twelve (12) Feedwater Sparger attachment bracket welds. EVT-1 / VT-1 of two (2) Jet Pump riser brace-to-vessel welds. No indications identified. Minor anomalies incidentally identified on several FW Sparger bracket pins.
	2008	VT-3	VT-3 of 5 Feedwater Sparger end brackets and attachment pins
		EVT-1	EVT-1 of 2 Core Spray bracket attachment welds
	2012	VT-3	VT-3 of 6 feedwater sparger end brackets and attachment pins. Wear identified on 5 of the 6 feedwater spargers end brackets and/or attachment pins. Wear was acceptable for continued use.
		EVT-1	EVT-1 of 8 Core Spray bracket attachment welds. No recordable indications. EVT-1 of 4 steam dryer support brackets. No recordable indications.
	2014	EVT-1, VT-1, VT-3	EVT-1/ VT-3 of four (4) Steam Dryer support brackets. New wear was observed at locations 094 and 274 deg and acceptable with engineering evaluation. Previously noted wear was observed on 004 and 184 deg with no changes. EVT-1 of four (4) Jet Pump Riser brackets attachment welds. No indications identified.

			VT-1 of three (3) lower surveillance brackets. No indications identified.
	2016	VT-3 EVT-1	EVT-1/ VT-3 of four Steam Dryer support brackets. New wear was observed at all locations and acceptable with engineering evaluation. The wear is consistent with the new footprint of the replacement dryer versus the OEM dryer, with the 40% increase in weight. EVT-1 of (3) Jet Pump Riser brackets attachment welds. No indications identified. EVT-1 of 2 Feedwater sparger end brackets and attachment pins. Wear identified was acceptable for continued use.
Steam Dryer	2002	VT-1, VT-3	VT-1 of all drain channel welds. VT-1 of upper and lower dryer bank tie bar welds and baffle plate welds. VT-3 of dryer bank end and top covers, and instrument tubing and supports. One (1) central bank upper tie bar severed, and one (1) instrument tube support-to-baffle plate broken. Broken tie bar and instrument tube removed from dryer. New, stiffer tie bars welded to central dryer banks.
	2004	VT-1	VT-1 of five (5) replaced central bank upper tie bars, ten (10) original bank upper tie bars, and outer bank hoods @ internal reinforcing plates and end plate welds, per SIL 644, Supp.1. No indications identified.
	2006	VT-1	Completed all remaining BWRVIP-139 recommended inspections on seventy four (74) locations. One small indication (7/16") identified at base of drain channel vertical weld. No other indications identified.

	2008	VT-1	Re-examined small indication (7/16") identified at base of drain channel vertical weld. No change noted. No other indications identified.
	2010	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A re-examination of (six) key high stress (red) locations and five (5) tie bars. No indications identified. Examination of all four (4) lifting lugs. Indications identified on anti-rotation tack welds. Accepted continued service by engineering evaluation.
	2012	VT-1	Re-examination of small (7/16") indication at base of drain channel vertical weld. No change noted. BWRVIP-139-A examination of eight high stress (red) locations and seven (7) tie bars. No indications identified in high stress locations. Existing deformation was identified in two of the tie bars and was accepted for continued service by an engineering evaluation. Examination of all four (4) lifting rod assemblies identified existing indications on each lifting rod assembly. These indications were accepted for continue service by engineering evaluation.
	2014	Replace-ment	As part of the EPU License Amendment Request (LAR), Exelon PBAPS replaced the Original Equipment Manufacturer (OEM) steam dryer with a 3-ring octagonal (Nordic style) Westinghouse dryer.
	2016	VT-3	General VT-3 as found was performed on: - Top and sides (incl. outside of skirt) - underside of RSD (incl. inside of skirt) - W and U channel guides - hold down rods and lifting rods - outer, middle and inner hoods - and support ring.

		VT-1	VT-1 of (71) recommended locations by the manufacturer. Indications were identified at bottom of the hold down rods on construction/ non-structural welds for all (4) HDRs and evaluated as acceptable as is with no repair. The welds will be reinspected next outage in 2018. No other indications identified.
Steam Separator	2006	VT-1	VT-1 examinations performed on a sample of upper and lower shroud head bolt support ring gussets. 12 of 24 lower ring gussets revealed degradation. No indications on upper support ring gussets. Indications acceptable for continued service.
	2008	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. 5 of 12 lower ring gussets with previously identified degradation had further crack growth and 4 lower gussets had new indications not previously identified. No indications were observed on the upper support ring gussets. All Indications are acceptable for continued service.
	2010	VT-1	VT-1 examinations performed on a sample of upper and re-examination of all lower shroud head bolt support ring gussets. Slight growth at one previously identified indication. New indication identified on six (6) gussets. All new indications were minor and acceptable for continued service. Wear identified on one (1) shroud head bolt pin/window. SHB was removed.
	2012	VT-1	VT-1 examinations were performed on all mid support ring gussets with new indications identified. These indications were acceptable for continued service based on an engineering evaluation. VT-1 examinations were performed on three shroud head bolts with indications identified on all three.

			VT-1 of four upper support ring gussets revealed no indications. VT-1 of all four lifting lug assemblies revealed existing indications on all four assemblies. These indications were acceptable for continued service as a result of an engineering evaluation.
	2014	VT-1	VT-1 examinations were performed on all (24) mid support ring gussets with (4) new indications identified. These indications were acceptable for continued service based on an engineering evaluation.
		VT-3	VT-3 examinations were performed on all (31) shroud head bolts with indications identified on (13) SHB. These indications were acceptable for continued service based on an engineering evaluation. Three (3) new SHB were installed as part of EPU.
		VT-1	VT-1 of four upper support ring gussets revealed no indications and VT-1 of all four lifting lug assemblies revealed previously identified indications on all four assemblies with no changes.
	2016	VT-3	VT-3 of (5) shroud head bolts.
		VT-3	VT-1 of (4) upper support ring gussets and (8) middle ring gussets revealed indications that were acceptable for continued service based on an engineering evaluation.
		VT-1	VT-1 of all four lifting lug assemblies revealed previously identified indications with no changes.
Dissimilar Metal Welds (BWRVIP-75-A)	2008	UT-E (E = encoded)	Performed Manual UT on three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was not ID connected and determined to be a fabrication flaw after comparison to

			construction radiographs. Indication was found acceptable, no further analysis or repairs required.
	2010	UT-E	Performed Manual UT of three (3) IGSCC Category D, dissimilar metal welds, all containing alloy 82/182 material. No indications were identified.
	2012	UT-E	Performed Manual UT of six (6) IGSCC Category D welds. Three of these welds were dissimilar welds. One indication identified on weld 2-AS-1 (Recirc Suction, N1A, Nozzle to Safe-end). Indication was evaluated per the requirements of Table IWB-3514-2 of ASME Section XI and was found to be acceptable.
	2014	UT-E	Performed Manual UT of one IGSCC Category D dissimilar weld, 3-I-19R (RPV, Nozzle N9 to Cap). No indications were identified.
	2016	UT-E	Performed Auto UT of (3) IGSCC Category D DM weld and Manual UT of one IGSCC Category A DM weld. No indications were identified.