EPRI | ELECTRIC POWER RESEARCH INSTITUTE

2011-149_____BWR Vessel & Internals Project (BWRVIP)

August 22, 2011

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

Attention: Andy Hon

Subject: Project No. 704 – BWR Vessel and Internals Inspection Summaries for Fall 2010 Outages

Enclosed are five (5) copies of the document entitled "BWR Vessel and Internals Project, Vessel Internals Inspection Summaries for Fall 2010 Outages, August 2011."

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 Chuck Wirtz, BWRVIP Integration Committee Technical Chairman, FirstEnergy, at 440.280.7665.

Sincerely,

Dave Czufin
Exelon
Chairman, BWR Vessel and Internals Project

G004
NRR

Additional copies have been sent to the PM

BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Fall 2010 Outages

August 2011

Table of Contents

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% Barring license renewal impacts, all seven horizontal welds will not be reinspected for ten (10) years.
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.
	2005	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.
	2005	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.
	2005	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.
Core Spray Piping	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.
	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.
	2008	EVT-1, VT-3	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. VT-3 visual inspection of Core Spray Sparger S-1/S-2 Repair Clamp; no evidence of clamp assembly looseness or degradation detected.
	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.
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.
	2005	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.
	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.
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.
	2005	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.
	2005	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.
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.
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.
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	EVT-1, 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 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.

	2008	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 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.
	2010	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).
Jet Pump Diffuser	N/A	N/A	N/A
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.
Vessel ID Brackets	2005	EVT-1, VT-1, VT-3	The dryer support brackets, guide rod brackets, feedwater sparger brackets, core spray piping brackets, jet pump riser support bracket, and shroud support were visually inspected in accordance with BFN Surveillance Instruction 1-SI-4.6.G. No indications recorded.
	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).
LPCI Coupling	N/A	N/A	Not applicable to this plant
Steam Dryer	2005	VT-1, VT-3	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

		VT-3	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. 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, VT-3	Four previously recorded relevant indications noted during Unit 1 Recovery were visually examined and confirmed. No change in condition was noted from what was previously reported in U1R7.
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.
Dissimilar Metal 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).
Dissimilar Metal Welds - BWRVIP-75-A	2008	UT	2 welds inspected (DRHR-1-2, DRHR-1-11): PDI-qualified, automated exams. No flaws identified, no repairs.

Cat. D	2010	N/A	No Cat. D DM Welds were inspected during Unit 1 Refueling Outage 8 (U1R8).

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, 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. 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
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 spargers nozzles (S3) and the sparger piping to VT-3. NRI.
	10/00 - R16	EVT-1,	Per BWRVIP-18: EVT-1 of all S1, S2

		VT-3	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.
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
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.
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 (312°-357°). NRI
	11/06 – R19	EVT-1,	VT-3 of accessible areas of H9 and EVT-

		VT-3	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 (132°-177°). NRI.
	11/10 – R21	UT	Welds on Access Hole Covers at 155° and 335°. The D3 AHC's have not been repaired. 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.
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.
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 3 beams.
	10/04 – R18	VT-3	Examined 17 group 3 beam bolt retainer mechanisms (weld-less keeper) to ensure all keepers were engaged. NRI.
		EVT-1	Examined 3 group 3 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 ageing 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
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.
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.
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 EVT-1	Examined 0° and 270° top guide alignment assemblies. NRI. Examined top guide rim weld. NRI
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
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 sides to meet SIL 409. NRI
	11/08 – R20	VT-1	Examined two SRM and four IRM dry tubes from 3 sides to meet SIL 409. NRI
	11/10 – R21	VT-1	Examined two SRM and four IRM dry tubes from 3 sides 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.
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.
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.

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	95	UT	Performed ultrasonic examination of the accessible areas. Baseline per BWRVIP-01, no indication were detected.
	01	UT	Performed ultrasonic examination of the H1-H7 welds , no indications found
	10	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.
Shroud Support	88/93	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	98	VT-3	VT-3 of shroud support
	99	VT-3	Shroud Support including H-8/H-9 (360 degrees)
	01	UT	Performed ultrasonic examination of the Access Hole Covers, no indications were reported.
	03	VT-3	Shroud Support including H-8/H-9 (180 to 360 degrees)
	05	VT-3	Shroud Support including H-8/H-9 (0 to 180 degrees)
	07	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
	09	VT-3	Shroud Support including the H-8/H-9 (0 to 180 degrees) – no indications
Core Spray Piping	96 (portion	VT	Performed Visual Examination (EVT,

	every RFO)		CSVT, VT-3), baseline per BWRVIP-18, no indications were detected.
	98	EVT-1	Reinspection per BWRVIP-18 – no indications.
	99	EVT-1	Reinspection per BWRVIP-18 – no indications
	01	EVT-1	Reinspection per BWRVIP-18 – no indications
	03	EVT-1	Reinspection per BWRVIP-18 – no indications
	05	EVT-1	Reinspection per BWRVIP-18 – no indications
	07	EVT-1	Reinspection per BWRVIP-18 – no indications
	09	EVT-1	Reinspection per BWRVIP-18 – no indications
	10	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.
	99	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted
	01	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted
	05	EVT-1	Examined S-1, S-2, and S-4 welds, VT-3 on S-3A/B welds. No indications noted
	09	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.)	95	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.
	98	VT-3	VT-3 0° location
	99	VT-3	Examined nine cells (top general and bottom of grid areas)
	01	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
	03	VT-3	Examined five cells (top general and bottom of grid areas)
	05	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.
	05	VT-3	Examined four cells (top general and bottom of grid areas).
	07	VT-1	Performed VT-1 examination of the bottom side of eight grid locations – no indications
	09	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
	10	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

Core Plate (Rim, etc.)	95	VT-3	Verified 25% core plate bolts were in place
	98	VT-3	Verified 20% core plate bolts
	99	VT-3	Examined Fuel support castings in nine cells, no indications
	01	VT-3	Verified rim hold down bolts 1-54 Examined Fuel support castings in ten cells, no indications
	03	VT-3	Examined Fuel support castings in five cells, no indications
	05	VT-3	Examined Fuel support castings in twenty cells, no indications
	07	VT-3	Performed a general VT-3 of Fuel Support Casting in eight locations – no indications
	09	VT-3	Performed a VT-3 examination of Fuel Support Castings in 12 locations – no indications
SLC	93	PT	Liquid Penetrant examination of the nozzle-safeend weld.
	01	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld., no indication.
	03	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld, no indication.
	05	EVT-2	Enhanced visual using Remote Visual Equipment on nozzle-safeend weld.
	07	UT	Performed Appendix VIII 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.

	98	MVT-1	50% of total number of jet pumps, 100% of each inspected – no indications All hold down beams – no indications
	99	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
	01	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.
	03	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.
	07	UT EVT-1	Performed UT of all 16 Jet Pump Holddown beams using GE technique – no indications 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
	09	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
	10	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.
Jet Pump Diffuser	96 (sample every RFO)	General Visual	Part of doing a 100% general visual examination
CRD Guide Tube	95 (every 10 years)	VT-3	Inspected accessible portions of three guide tubes, no indication were detected.

	03	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	05	VT-3	Inspect CRGT-1, CRGT-2, CRGT-3, and alignment pin on five guide tubes, no indications detected.
	07	VT-3	Performed general VT-3 examination of eight locations – no indications
CRD Stub Tube	95 (every 10 years)	VT-3	Inspected accessible portions of three stub tubes, no indication were detected.
In-Core Housing			
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
	99	VT-3	Inspected accessible portions of 11 dry tubes, no indications noted
	07	VT-1	Performed VT-1 of upper 24" of five dry tubes. Note the exam was performed on the accessible areas – no indications
	09	VT-1 VT-3	Performed examination on four dry tubes. Note the exam was performed on the accessible areas – no indications
	10	VT-1	Performed examination on six dry tubes. Note the exam was performed on the accessible areas – no indications
Instrument Penetrations			
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	98	VT-3	No indications
	99	VT-3	No indications
	03	VT-3	No indications
	05	VT-3	No indications

	07	VT-3	Performed VT-3 of interior portion of the RPV Head – no indications
Guide Rods	98	VT-3	No indications
	99	VT-3	Both examined (found cracked tack weld on 0 degree rod which was evaluated as acceptable)
	01	VT-3	Inspected 0 degree guide rod, no additional indications
	03	VT-3	Inspected 180 degree guide rod, no indications
	07	VT-3	Inspected 180 degree guide rod, bracket, and bracket welds – no indications
	09	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 Attachment	98	VT-1 VT-3	No indications
	99	VT-1 VT-3	108 and 288 degree examined with no indications
	01	VT-1 VT-3	108 degree examined with no indications
	03	VT-1 VT-3	36 and 108 degree examined with no indications
	05	VT-1 VT-3	288 degree examined with no indications
	07	VT-3	108° location – no indications
	09	VT-3	288° location – no indications
Core Spray Bracket	98	VT-3	No indications
	01	VT-3	No indications
	05	VT-3	No indications
	09	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 locations
Jet Pump Riser Support Pads	98	VT-1	No indications
	03	VT-1	216 degree pad – no indications
	05	VT-1	144 and 252 degree pads – no indications
Feedwater Spargers	98	VT-1 VT-3	Indications around flow holes
	01	VT-1 VT-3	No additional indications
	05	VT-1 VT-3	No additional indications
	07	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).
	09	VT-1 EVT-1/	Performed VT-1 of the Inner Radii at 45°, 135°, 225°, and 315° - no indications Performed EVT-1/VT-3 of Bracket

		VT-3	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-1/89	Performed visual examination of the flow holes on the T-Box and Spargers
Steam Dryer	03	VT-1/3	Inspect per GE SIL644. Indications in Upper Support Ring, Drain Channels, and Access Openings- all indications evaluated "use as is".
	05	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
	07	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.)
	09	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.
	10	VT1/89	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.
Dissimilar Metal weld (per BWRVIP-75-A)	09	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.
	10	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.

Reactor Internals Inspection History

Plant: **Fermi 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud (BWRVIP-07/76)	RF04	VT-1 (1mil wire)	Inspected: 100% ID welds H2, H3, and, H4; 100% OD welds H1-H7; accessible areas H8 & H9
		VT-1/VT-3	The only indications identified were two <1" vertical in orientation above the H2 weld at azimuth 125 degrees. These were evaluated against established flaw screening criteria and found acceptable.
	RF05	EVT-1 (1/2mil wire)	Inspected approximately 60-70 degrees arc on the core shroud in area of previous indications. H2-H4 inspected on shroud ID, H1-H7 inspected on shroud OD. No new indications, no change observed in previous indications above H2 weld.
	RF06	UT	Performed focused phased array UT examination of the H3, H4, H5 and H7 welds utilizing GE's universal carousel. No indication of cracking was identified.
		EVT-1	A cursory exam was performed on H-3 weld to confirm UT results for information only. No new indications and no change was observed in the previous indication above H2 weld.
	RF07	EVT-1	Reinspected the indication above the H2 weld on the inside of the shroud. No change in appearance. The control rod blade was withdrawn to perform the examination.
	RF08	N/A	No inspections performed on the Core

			Shroud. Inspections were performed on the Shroud Support
	RF09	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support
	RF10	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support
	RF11	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support
	RF12	UT	Performed phased array UT examination of the H3, H4, H5 and H7 welds from both sides utilizing AREVA's demonstrated technique. No indication of cracking was identified. Inspection coverage exceeded 60% for all welds with coverage spaced around the entire circumference.
	RF13	UT	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support.
	RF14 (10/10)	UT	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support.
Shroud Support (BWRVIP-38/*104) Access Hole Cover (BWRVIP-180)	RF03	VT-3	Inspected shroud support gusset welds and H8/H9 in conjunction with jet pump inspections. No indications
	RF04	VT-1/VT-3	Inspected areas in conjunction with jet pumps, included were gusset welds H8 and H9. H8 and H9 welds inspected at 0 and 180 degrees with 1 mil wire. No indications.
	RF05	EVT-1 (1/2 mil)	Inspected sample area 60-70 degree arc plus 180 degrees location on H8, H9, and gussets. No indications.
	RF06	VT-3*	*Inspection performed in conjunction

			with jet pump inspections. Approximately 50% of the gussets and H8 and H9 welds were inspected. This was a best effort exam which ranged from MVT-1 to VT-3 depending on camera angle and lighting. No cleaning was performed. No indications identified.
	RF07	EVT-1	*Inspection performed in conjunction with jet pump inspections. Remaining 50% of the gusset welds were inspected. This was a best effort exam which ranged from EVT-1 to VT-3 depending on camera angle and lighting. (Credited as a n EVT-1 exam) No cleaning was performed or needed. No indications identified. The H8 and H9 welds were inspected in detail at 0 and 180 Deg. Azimuth to EVT-1 standards where there were no obstructions.
	RF08	EVT-1	The H8 and H9 welds were reinspected to achieve required coverage. 22% of both welds were inspected and included the areas at 0 and 180 degrees as well as adjacent to Jet Pumps 2 and 3. Accessible areas on Gussets 1, 3, 11, 12, and 22 were inspected. No indications of cracking identified.
	RF09	EVT-1 VT-1	The H8 and H9 welds were inspected adjacent to Jet Pumps 3 and 4(Coverage obtained 1% and 8.3%). Accessible areas on Gussets 2 and 15 inspected (90% coverage on each obtained). Both access hole covers were inspected (VT-1). No indications identified.
	RF10	EVT-1/ VT-1	The H8 and H9 welds were inspected adjacent to Jet Pump 5(Coverage obtained 1% and 8.3%). Accessible areas on Gussets 7 and 8 inspected (70/90% coverage obtained @VT-1

			quality, EVT-1 not credited, CARD 05-20378). No indications identified.
	RF11	EVT-1	The H8 and H9 welds were inspected at 0 and 180 degrees as well as several other locations. Coverage obtained was 24% for H8 and 30% for H9. Accessible areas on Gussets 5, 6, 7, 8, 9, 10, 18, and 21 were inspected with 50% to 80% coverage obtained @ EVT-1. No indications identified.
		UT	A portion of the H9 weld was examined from the vessel outside diameter using a manual technique as required by BWRVIP-104. Approximately 19.6% of weld was examined with no indications.
	RF12	EVT-1	Accessible areas on Gussets 4 and 13 were inspected with 55% to 80% coverage obtained using EVT-1. No indications identified. Both Access Hole covers were inspected per draft BWRVIP -180 requirements. Cracking identified on 0 degree cover. Reference OE 25794.
	RF13	EVT-1	Accessible areas on Gussets 5 and 6 were inspected with 75% coverage obtained using EVT-1. No indications identified. The O Degree Access Hole cover was reinspected and no additional cracking was identified. No repair installed.
	RF14 (10/10)	EVT-1	Accessible areas on Gussets 1, 21, and 22 were inspected with 50% - 60% coverage obtained using EVT-1. No indications identified. All 3 welds on the 0 Degree Access Hole Cover were reinspected and no additional cracking was identified. No repair installed.
Core Spray Piping (BWRVIP-18/18-A)	each outage RF01 thru RF04	VT-1 (1mil)	During RF-01 two small arc strikes were identified on loop piping. These have been reinspected each outage. No

			change in condition. Inspections performed per IEB 80-013 and SIL 289. No indication of cracking.
	RF05	EVT-1 (1/2mil) VT-1	All welds brushed prior to inspection using 1/2 mil wire. Remainder of loop piping inspected without brushing. No indication of cracking.
	RF06	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards as opposed to BWRVIP-18 requirements of MVT-1. Cleaning assessment was performed – cleaning was not necessary. No indication of cracking.
	RF07	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards. Cleaning assessment was performed – cleaning was not necessary. No indication of cracking.
	RF08	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards. Cleaning assessment was performed, cleaning was not necessary. No indication of cracking.
	RF09	EVT-1	Inspected all target welds on both loops of core spray and sample welds on Div 2 to EVT-1 stnds. Cleaning assessment was performed, cleaning was not necessary. No indications of cracking.
	RF10	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 2 to EVT-1. Cleaning assessment was performed, cleaning was necessary for selected locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >80%.
	RF11	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds

			on Div 1 to EVT-1. Cleaning assessment was performed, cleaning was necessary for selected locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >80%.
	RF12	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 1 to EVT-1. Cleaning assessment was performed, cleaning was necessary for selected locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >55%.
	RF13	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 2 to EVT-1. Cleaning assessment was performed, cleaning was necessary for selected locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >55%.
	RF14 (10/10)	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 2 to EVT-1. Cleaning was performed for all locations and welds were hydrolazed or brushed. No indications of cracking. Inspection coverage reported separately but generally >60%.
Core Spray Sparger (BWRVIP-18/18-A)	each outage RF01-RF04	VT-1 (1 mil)	During RF01 one arc strike identified on upper CS sparger. Reinspections have not identified any changes. No indication of cracking
	RF05	VT-1/EVT-1 (1/2mil)	1/2 mil wire used for junction box remainder utilized 1mil wire. No indication of cracking.
	RF06	EVT-1,	Inspected per BWRVIP-18 using EVT-

		MVT-1	1 for sparger T-box and end caps and MVT-1 for remaining locations. No indications of cracking.
	RF07	EVT-1/VT-1	Inspected per BWRVIP-18 using EVT-1 for sparger T-box welds, end cap welds, drain plug welds, and support brackets and welds, and VT-1 for flow nozzles and tack welds. No indications of cracking identified.
	RF08	EVT-1/VT-1	Inspected per BWRVIP-18 using EVT-1 for S1, S2 and S4 welds. Selected S3a, S3b welds inspected using VT-1. Selected S3c welds as well as selected SB bracket welds were inspected using EVT-1 technique. A best effort exam was performed on all accessible areas. No indications of cracking identified.
	RF09	EVT-1/VT-1	Inspected per BWRVIP-18 using EVT-1 for 50% of the S1, S2 and S4 welds and VT-1 for 50% of the S3a, S3b and S3c welds on the same spargers. 9 SB bracket welds were inspected using EVT-1 technique. Coverage for specific welds will be reported separately. No indications of cracking were identified.
	RF10	EVT-1/VT-1	Inspected per BWRVIP-18 using EVT-1 for 50% of the S1, S2 and S4 welds and VT-1 for 50% of the S3a, S3b and S3c welds on the same spargers. 6 SB bracket welds were inspected using EVT-1 technique. Coverage for specific welds will be reported separately but was > 60% for welds and >85% for brackets. No indications of cracking were identified.
	RF11	EVT-1/VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the same spargers. 6 SB bracket welds were inspected using VT-1 technique. Coverage for specific

			welds will be reported separately but was > 50% for welds and >75% for brackets. No indications of cracking were identified
	RF12	EVT-1/VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the same spargers. 6 SB bracket welds were inspected using EVT-1 technique. Coverage for specific welds will be reported separately but was > 40% for welds and >75% for brackets. No indications of cracking were identified.
	RF13	EVT-1/VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the same spargers. 6 SB bracket welds were inspected using EVT-1 technique. Coverage for specific welds will be reported separately but was > 50% for welds and >70% for brackets. No indications of cracking were identified.
	RF14 (10/10)	EVT-1/VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the C and D spargers. 6 SB bracket welds and S3 nozzle welds were inspected using VT-1 technique. Coverage for specific welds will be reported separately but was > 40% for welds and >60% for brackets. No indications of cracking were identified.
Top Guide (Rim, etc.) Beams (BWRVIP-26) (BWRVIP-183)	Each outage	VT-3	Inspected rim each outage. No indications.
	RF03	VT-1	Inspected 6 locations (RICSIL 059). No indications.
	RF04	VT-1	Inspected 6 locations (SIL 554). No indications.
	RF05	VT-1	Inspected 15 locations (SIL 554). No indications.

	RF06	VT-1	Inspected bottom edge of beams at 11 core locations per SIL 554. No indication of cracking.
	RF07	VT-1	Inspected bottom edge of beams at 8 core locations per SIL 554. No indication of cracking.
	RF08	VT-1	Inspected bottom edge of beams at 5 core locations per SIL 554. No indication of cracking.
	RF09	VT-1	Inspected bottom edge of beams at 6 core locations per SIL 554. No indication of cracking.
	RF10	VT-1	Inspected bottom edge of beams at 2 core locations per SIL 554. No indication of cracking.
	RF11	VT-1	Inspected bottom edge of beams at 2 core locations per SIL 554. No indication of cracking. Inspected 90 degree segment of top guide rim and no indications were identified.
	RF12	VT-1/VT-3	Inspected intersection and bottom edge of beams at 5 core locations per SIL 554. No indication of cracking.
	RF13	EVT-1	Inspected intersection and bottom edge of beams at 5 core locations per BWRVIP-183 utilizing a new visual inspection tool. No indication of cracking.
	RF14 (10/10)	EVT-1	No inspections performed RF14.
Core Plate Rim Bolts, etc. (BWRVIP-25)	RF05	VT-1 (1mil wire)	Inspected 6 core plate bolts located between 100 and 160 degrees and adjacent area. No indications.
	RF06	VT-3	Inspected tops of approximately 20 bolts per SIL 588. No indications identified.

	RF07	VT-3	Inspected tops of approximately 20 bolts per SIL 588. No indications identified.
	RF08	VT-3	Inspected tops of approximately 20 core plate bolts (VT-3) per SIL 588. Did not meet BWRVIP requirements. No indications identified.
	RF09	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2003-117 and TJ-2003-01)
	RF10	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2003-117 and TJ-2003-01)
	RF11	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2006-041 and DD-2006-01)
	RF12	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2006-041)
	RF13	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2006-041)
	RF-14 (10/10)	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2006-041) BWRVIP 2010- 243 now requires preparation of a Deviation Disposition by 3/31/2011.
SLC (BWRVIP-27)	RF04	VT-3	Performed a visual inspection from Reactor penetration to shroud support when access was provided during jet pump beam replacement. No indications.

	RF05 - RF07	N/A	No inspections performed as access was not provided.
	RF08	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, but did not remove mirror insulation box from safe-end. No leakage observed.
	RF09	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF10	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF11	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF12	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF13	VT-2*/UT	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed. Performed a manual PDI qualified ultrasonic inspection of the nozzle to safe end weld as well as additional base material of bored material. No indications identified.
	RF-14 (10/10)	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation

			box for the safe-end for direct inspection. No leakage observed.
Jet Pump Assembly (BWRVIP-41)	Each outage examine at least 50% thru RF05	VT-1 VT-3	Jet pump assemblies are inspected each outage from top to bottom. During RF-04 all (20) hold down beams were replaced as a preventative measure and to avoid performing UT's on the old style/original beams. Inspections are performed to the recommendations of SIL 551, 574, 465 S-1, and RICSIL 078. During RF05 one of the 80 restrainer screw tack welds was found to be cracked. This was evaluated and was not repaired during RF05.
	RF06	MVT-1, VT-3	Performed inspections to the intent of BWRVIP-41 as well as augmented VT-3 of selected areas on jet pumps 1-10. Inspections included all High, Medium and Low Priority locations. Inspected RS-1 and RS-2 welds on jet pumps 11-20. One indication identified on RS-1 weld, 1.75" long. JCO performed prior to start-up. No other new indications identified.
	RF07	EVT-1	Performed inspections to the intent of BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected areas on jet pumps 11-20. Inspections included all High, Medium and Low Priority locations. Reinspected previously identified indication on RS-1 weld, 1.75" long that was identified in RF06. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. No other indications or changes in previous indications identified.
	RF08	EVT-1	Performed reinspections to the intent of BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected areas on jet pumps 1& 2.

			Inspections included all High, Medium and Low Priority locations. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7&8 that was identified in RF06. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 jet pumps per recommendations of SIL 629 and verified no wedge damage (WD-1) as well as full contact with restrainer screws. No damage identified on any location. Reinspected all restrainer screw tack welds with no changes observed.
	RF09	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected areas on Jet Pumps 3 & 4. Inspections included all High, Medium and Low Priority locations. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7&8 that was identified in RF06. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 Jet Pump Hold Down Beams by UT for BB1, BB2, and the transition area BB3 using the latest available technique from General Electric. No indications identified on the beams. Reinspected all restrainer screw tack welds, contact area, and wedges after both tack welds on Jet Pump 15 were found cracked. No other damage or indications identified on any location. Jet Pump 15 permanently repaired by the installation of an auxiliary spring wedge. (Reference CARD 03-16929)

	RF10	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on Jet Pumps 4, 5, 6, 7, & 8. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7 & 8 that was identified in RF06. No change in indication length / appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Reinspected auxiliary spring wedge on Jet Pump 15. No other damage or indications identified on any location.
	RF11	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on Jet Pumps 7, 8, 9, & 10. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7 & 8 that was identified in RF06. No change in indication length / appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all Jet Pump wedges after wear was identified on JP2 restrainer bracket. Performed inspection of other welds on Jet Pump 2 as required by BWRVIP-41. Auxiliary spring wedges installed on Jet Pumps 1 and 2 and a slip joint clamp was installed on Jet Pump 2 to restore integrity. No other damage or indications identified.
	RF12	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on Jet Pumps 7, 8, 9, 10, 11, & 12. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7 & 8 that was identified in RF06. No change in indication length / appearance.

			Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 Jet Pump Hold Down Beams. Inspected 12 Jet Pump wedges including the wedges and hardware (auxiliary spring wedges and slip joint clamp) installed in RF11. No other damage or indications identified.
	RF13	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on Jet Pumps 7, 8, 9, 10, 13, 14, 15, and 16. Reinspected previously identified indication on RS-1 weld for Jet Pumps 7/8 identified in RF06. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected 9 Jet Pump wedges. No other damage or indications identified.
	RF14 (10/10)	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on most Jet Pumps including RS-8/9 welds on all pumps. Reinspected previously identified indication on RS-1 weld for Jet Pumps 7/8. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 Jet Pump wedges. Minor movement noted but no other damage or indications identified.
Jet Pump Diffuser (BWRVIP-41)	Each outage	VT-3	Diffusers will be sample inspected during refueling outages.
	RF06	MVT-1	BWRVIP-41 on Jet Pumps 1-10 except inaccessible areas. No cracking.
	RF07	EVT-1	BWRVIP-41 on Jet Pumps 11-20 except inaccessible areas. No cracking

			identified. Welds DF-3, AD-1, and AD-2 are inaccessible for inspection.
	RF08	EVT-1	BWRVIP-41 reinspection on Jet Pumps 1 and 2 except inaccessible areas. No cracking identified. Welds DF-3, AD-1, and AD-2 are inaccessible for inspection.
	RF09	EVT-1	BWRVIP-41 reinspection on Jet Pumps 3 and 4 except inaccessible areas. No cracking identified. Welds DF-3, AD-1, and AD-2 are inaccessible for EVT-1 visual inspection, VT-3 performed. (TJ-2003-02 prepared as justification)
	RF10	EVT-1	BWRVIP-41 reinspection of selected DF-1 and DF-2 welds on Jet Pumps 5, 6, 7, & 8. Performed access study for future performance of UT examinations of welds DF-3, AD-1, and AD-2. These welds are inaccessible for visual inspection. VT-3 performed. No indications identified (Reference TJ-2003-02)
	RF11	EVT-1	BWRVIP-41 reinspection of selected DF-2 welds on Jet Pumps 9 & 10.
		UT	Performed of UT examinations on a portion of a total of 17 DF-3, AD-1, and AD-2 welds using specialized tooling. These welds are inaccessible for visual inspection. No indications identified (Reference DD-2006-02)
	RF12	EVT-1	BWRVIP-41 reinspection of selected DF-1 and 2 welds on Jet Pumps 6, 11, & 12.
		UT	No UT examinations performed during RF12 due to tooling failures. These welds are inaccessible for visual inspection. (Reference DD-2006-02)
	RF13	EVT-1	BWRVIP-41 reinspection of selected

			DF-1 and 2 welds on Jet Pumps 7, 13, & 14.
		UT	No UT examinations performed during RF13 due to tooling failures. These welds are inaccessible for visual inspection. (Reference DD-2006-02)
	RF14 (10/10)	EVT-1	BWRVIP-41 reinspection of selected DF-1 and 2 welds on Jet Pumps 7, 8, 9, and 13-18. No indications identified.
		UT	Completed baseline UT examinations on all 20 Jet Pumps Diffuser/Adapter DF-3, AD-1 and AD-2 welds, (60 welds) since these welds are inaccessible for visual inspection. Deviation Disposition is no longer needed.
CRD Guide Tube (BWRVIP-47)	RF04	VT-3	Inspected lower portion of peripheral guide tubes and stub tubes when access was provided during jet pump hold down beam replacement. No indications identified.
	RF07	EVT-1 and VT-3	Performed best effort exam on CRGT-3 as weld was not visible on inside of tube. CRGT-2 not accessible due to flow and ARPIN was not felt to be accessible. No indications identified.
	RF08	EVT-1 and VT-3	Performed best effort exam on CRGT-3 as weld was not visible on inside of tube. CRGT-2 not accessible due to flow and FS/GT-ARPIN was not felt to be accessible. No indications identified.
	RF09	EVT-1 and VT-3	Performed exams on CRGT-1, CRGT-2, CRGT-3, and FS/GT-ARPIN at 10 Control Rod Guide Tubes/locations. No indications identified.
	RF10	EVT-1 and VT-3	No inspection performed in RF10.

	RF11	EVT-1 and VT-3	No inspection performed in R11.
	RF12	VT-3	Performed exams on CRGT-1 and FS/GT-ARPIN at 5 Control Rod Guide Tubes/locations. CRGT-2 and CRGT-3 not performed or credited due to high flow conditions. No indications identified.
	RF13	EVT-1 and VT-3	No inspections performed in RF13.
	RF14 (10/10)	EVT-1 and VT-3	Completed all remaining baseline inspections on the Control Rod Guide Tubes. Inspections performed on (4) CRGT-1, and FS/GT-ARPIN locations and on (9) CRGT-2 and CRGT-3 locations. One manufacturing flaw identified that did not impact the functionality of the component.
CRD Stub Tube * (BWRVIP-47)	RF04	VT-3	Inspected lower portion of peripheral guide tubes and stub tubes when access was provided during jet pump hold down beam replacement. No indications identified.
In-Core Housing * (BWRVIP-47)	RF04	VT-3	Small portion visible during jet pump beam replacement. No indication of degradation.
Dry Tube * (BWRVIP-47)	Each outage	VT-1	9 of 12 tubes found not completely seated. Performed all inspections per SIL 409 and RICSIL 073. No indications of cracking.
	RF06	VT-1	Reinspected 12 dry tubes. No change from previous condition. No cracking.
	RF07	VT-1	Inspected all 12 original design Dry Tubes. No change from previous conditions identified. No cracking identified.
	RF08	VT-1	Inspected all 12 original design Dry Tubes from two sides. No change from

			previous conditions identified. No cracking identified.
	RF09	N/A-1	No inspections performed in RF09.
	RF10	VT-1	Inspected all 12 original design Dry Tubes from two sides. Linear indications identified on 7 tubes in the collar region above the pressure boundary weld. Evaluated as acceptable for one cycle of operation. Plan to replace in RF11. (Reference CARD 04-25703)
	RF11	VT-1	Replaced all 12 Dry Tubes in RF11. Performed baseline VT-1 and verified proper engagement in Top Guide.
	RF12	VT-1	No inspections performed in RF12.
	RF13	VT-1	No inspections performed in RF13.
	RF14 (10/10)	VT-1	No inspections performed in RF14.
Instrument Penet.* (BWRVIP-49 & 41)	Each outage	VT-3	Inspected jet pump sensing lines and brackets each outage.
	RF04	VT-3	SLC and peripheral bottom head penetrations inspected. No indications.
	RF06	VT-3	Inspected JP sensing lines for pumps 1-10. No indications.
	RF07	VT-3	Inspected JP sensing lines for pumps 11 thru 20 only. No indications.
	RF08	VT-3	Inspected JP sensing lines for Pumps 1 & 2 only. No indications.
	RF09	VT-3	Inspected JP sensing lines for Pumps 3 & 4 only. No indications.
	RF10	VT-1	Inspected JP sensing lines for Pumps 5, 6, 7, 16, & 17. No indications

	RF11	VT-1	Inspected JP sensing lines for Pumps 6, 7, 16, & 17. No indications.
	RF12	VT-1	Inspected JP sensing lines for Pumps 6, 7, 11, 12, 16, & 17. No indications.
	RF13	VT-1	Inspected JP sensing lines for Pumps 6, 7, 13, 14, 16, & 17. No indications.
	RF14 (10/10)	VT-1	Inspected JP sensing lines for Pumps 6, 7, 15, 16, 17, & 18. No indications.
Vessel ID Brackets (BWRVIP-48)	Each outage	VT-1/3	Inspect sample population each outage. We have inspected most brackets each outage (core spray, feedwater). Jet pump riser brace, steam dryer support lugs, guide rod brackets and specimen holder brackets are sample inspected. No indications of cracking identified.
	RF06	MVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket 1 specimen bracket. No indication of cracking.
	RF07	EVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket No indication of cracking identified.
	RF08	EVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket Surveillance holder and Brackets @ 30 az. No indication of cracking identified.
	RF09	EVT-1	6 Feedwater brackets. 4 Core Spray piping brackets. 1 Jet Pump riser brace (Jet Pump 3 and 4) No indication of cracking identified.

	RF10	EVT-1	6 Feedwater brackets. 3 Core Spray piping brackets. 1 Surveillance Holder bracket 4 Steam Dryer Support brackets 4 Steam Dryer Hold Down 1 Guide Rod Bracket 1 Jet Pump riser brace (Jet Pump 5 and 6) No indication of cracking identified.
	RF11	EVT-1/VT-1	No inspections performed in RF-11.
	RF12	EVT-1/VT-1	6 Feedwater Sparger bracket sets. 1 Surveillance Holder bracket 4 Steam Dryer Support brackets 1 Guide Rod Bracket 2 Jet Pump riser braces (Jet Pumps 7, 8, 9, & 10) No indication of cracking identified.
	RF13	EVT-1/VT-1	No inspections performed in RF-13.
	RF14 (10/10)	EVT-1/VT-1	3 Feedwater Sparger bracket sets. 2 Core Spray Piping Brackets 1 Surveillance Holder bracket 4 Steam Dryer Support brackets 1 Guide Rod Bracket 2 Jet Pump riser braces (Jet Pumps 1/ 2, and 11/12) No indication of cracking identified.
LPCI Coupling	N/A	N/A	Fermi does not have a LPCI Coupling
Shroud Head Bolts/Shroud Head	RF04	UT/VT	16 had indications, 17 replaced during RF04.
	RF05		Remaining bolts replaced (31) during RF05 as a preventative measure. All 48 are now new style.
	RF06	VT-3	Bolts 1-24 (of 48). No indication of cracking.
	RF07	VT-3	Bolts 25-48 (of 48). No indication of

			cracking or damage. Springs were left compressed on 20 of the 24 inspected.
	RF08	VT-3	Bolts 1-24 (of 48). No indication of cracking or damage
	RF09	VT-3	Bolts 23 and 25-48 (of 48). No indication of cracking or damage. All retainer springs verified to be functioning properly.
	RF10	VT-3	Bolts 1-24 (of 48). Inspected North 1/3rd of Shroud Head/Separator and 2 lifting lugs. No indication of cracking or damage
	RF11	VT-3	Inspected Bolts 25-48 (of 48) and inspected Center 1/3rd of Shroud Head/Separators. No indication of cracking or damage.
	RF12	VT-3	Bolts 1-24 (of 48). Inspected South 1/3rd of Shroud Head/Separator and 2 lifting lugs. All mid support ring gussets were inspected and small short cracks were identified on 3 of the 24 gussets. No repairs were required. Ref. OE 25795.
	RF13	VT-3	Bolts 25-48 (of 48). Inspected North 1/3rd of Shroud Head/Separator and 2 lifting lugs. No changes identified in previous indications identified in RF12. No other indications identified.
	RF14 (10/10)	VT-3	Bolts 1-24, 27, 30, & 33 (of 48). Inspected Center 1/3rd of Shroud Head/Separator. No changes identified in previous indications and no new indications identified.
Steam Dryer (RF01-RF-08 not previously reported)	RF09	VT-3	Inspected approximately 1/3 of dryer including hood welds and cover plate welds. (Ref. SIL 644) No indications of additional cracking identified.
	RF10	VT-1/VT-	Inspected approximately 50% of dryer

		3	including all inner hood vertical welds as recommended in SIL 644, Supplement 1, and Revision 1). Several new indications were identified near welds due to new locations being inspected and the change in technique. Indications were noted at base of inner hood vertical welds. Reference CARD 04-25416 and also OE #17600. No changes were identified on previously recorded indications.
	RF11	VT-1/VT-3	Inspected approximately 50% of dryer including all inner hood vertical welds as recommended in SIL 644, Revision 1 and BWRVIP-139. Several new indications were identified near welds due to new locations being inspected and the change in technique. Indications previously noted on hood welds in RF10 were reinspected and no changes were noticed.
	RF12	VT-1/VT-3	Inspected approximately 50% of dryer including inner hood vertical welds as recommended in BWRVIP-139. Several new small indications were identified near welds due to new locations being inspected and the change in technique and camera angles used. Indications previously noted on hood welds were reinspected and no changes were noticed.
	RF13	VT-1/VT-3	Inspected approximately 20% of dryer including "F" Bank welds and a sampling of other locations following reinspection guidelines contained in NRC SE to BWRVIP-139. One new indication identified in support ring.
	RF14 (10/10)	VT-1/VT-3	Inspected approximately 20% of dryer including "E" Bank welds and a sampling of other locations following reinspection guidelines contained in BWRVIP-139-A. No new indications

			identified.
Dissimilar Metal Welds BWRVIP-75-A (Not previously reported, reference BWRVIP letter 2008-089)	RF-12	UT	Performed ultrasonic examinations on 4 Category B DM welds that contain alloy 82/182 using automated PDI qualified techniques and procedures. Since >90% coverage was not obtained on two welds, 2 additional welds were selected and >90% volume coverage was obtained. No indications of cracking identified.
	RF-13	UT	Performed ultrasonic examinations on 5 Category B DM welds that contain alloy 82/182 using automated and manual PDI qualified techniques and procedures. No indications of cracking identified.
	RF-14 (10/10)	UT	Performed ultrasonic examination of 1 Category B DM weld that contained alloy 82/182 using manual PDI qualified technique and procedure. No indications of cracking identified.

*VT-2 leakage inspections have been and are performed on all RPV Instrumentation Nozzles and Piping Nozzles each refuel outage. An enhanced leakage inspection is performed on all locations to ensure no pressure boundary leakage. Inspections are performed in the annulus area adjacent to the vessel skirt, and are performed under vessel to ensure that any leakage identified is not from welded connections. Flange leakage from CRDM's is recorded, evaluated, and repaired if necessary. Mirror insulation is opened for SLC safe end inspection and for bottom head inspections but is not removed from other locations unless the leakage source can't be determined.

Fermi 2 Refueling Outages

RF01:	Fall of 1989		
RF02:	Spring of 1991		
RF03:	09-21-92	10-31-92	Inspection sign on/off dates
RF04:	05-10-94	09-21-94	Inspection sign on/off dates
RF05:	09-30-96	11-04-96	Inspection sign on/off dates
RF06:	09-08-98	10-08-98	Inspection sign on/off dates
RF07:	04-03-00	05-04-00	Inspection sign on/off dates
RF08:	10-15-01	11-20-01	Inspection sign on/off dates
RF09:	03-28-03	04-28-03	Inspection sign on/off dates
RF10:	11-06-04	11-26-04	Inspection sign on/off dates

RF11:	03-24-06	04-29-06	Inspection sign on/off dates
RF12:	09-28-07	11- 01-07	Inspection sign on/off dates
RF13:	03-28-09	04-16-09	Inspection sign on/off dates
RF14:	10-25-10	11-22-11	Inspection sign on/off dates

Reactor Internals Inspection History

Plant: **James A. FitzPatrick Nuclear Power Plant**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud	1994 to present	UT, EVT-1 VT-3 For Shroud Tie Rods	94/95 Outage: Planar flaws on H2, 35" length intermittent (ID/OD) less than 0.75" depth by UT; two small planar flaws on H3, 1.42" length (ID/OD) by UT . A calculated 136" of vertical weld were inspected by EVT-1 or UT with no relevant indications. 96 Outage: Crack like indications on H2, 55" length intermittent (OD) by EVT-1. This cracking is being mitigated by the shroud repair from 94/95 outage with 10 tie-rods; vertical crack like indications on SV5A intermittent (OD) totaling 6-3/4" in length out of total 92", and two horizontal ½" each (one OD and one ID). Crack like indications were less than 10% of weld length and are within allowable per BWRVIP-07. Shroud inspections included 25% vertical welds with 50% at beltline areas, and 3 tie-rods. A calculated 286" of vertical welds were inspected. No relevant indications on other welds. Tie-rod assemblies were found acceptable.
	Fall 1998 (RO13)	EVT-1	Baseline completed per BWRVIP-07 Guidelines (by EVT-1) for all vertical welds. 100% of beltline shroud welds inspected in RO-13. Relevant indications found in 5 welds as follows: *SV5A OD-There are 6 indications with a combined length of 9.3 inches. *SV5B OD-There are 18 indications with a combined indication length of 45.8 inches. *SV6A OD-There is 1 indication that is measured to be 1" long. *SV6B ID-There is 1 indication in the

			weld which is measured to be 0.8 inches long. *SH4 Indication-Indication is 3 inches from SV5A ID and is 6 inches long and goes across the SH4 horizontal weld. No relevant indications noted on other vertical welds.
	2000 (RO14)	EVT-1	Re-inspected per BWRVIP-76 Guidelines: Vertical Welds SV5A, SV5B, SV6A and SV6B. Relevant indications found in these welds are as follows: *SV5A OD-There are 7 indications total with a combined indication length of 11.7" vertical and 3.3" circ. *SV5B OD-There are 19 indications total with a combined indication length of 50.7" vertical. *SV6A OD-There is one vertical indication that is measured to be 1" long. *SV6B ID-There is one vertical indication in the weld measured to be 1.25" long. *SH4 ID-There is 2 vertical indications across SH4 with total combined length of 6.4". The closest indication is 3" from SV5B. This indication is branching out near the bottom portion.
	2002 (RO15)	EVT-1	Re-inspected by BWRVIP-76 Guidelines: Vertical Welds SV2B, SV5B, and SV8A; and Radial Ring Welds SV3A and SV3D. Relevant indications were only noted on the SV5B weld, as follows: • SV5B ID and OD. There appears to be no discernable changes this outage affecting the cracks length from RO14; though one additional indication is noted on the ID CCW side of the weld approximately ½" long. This indication may be associated with indications on the opposite side (OD) at the same

			location.
	2004 (RO16)	EVT-1	Inspected Vertical Welds SV2A, SV8C, SV9A, SV9B and SV9C. No relevant indications noted.
	2006 (RO17)	UT	Inspected Vertical Welds SV4A, SV4B, SV5A and SV5B. No relevant indications noted for welds SV4A and SV4B. For Welds SV5A and SV5B, there is close correlation of flaws from previously seen by EVT-1 in R14, with limited crack growth and no through wall indications. Identified some additional (short intermittent) flaws at Weld SV5A. All indications were satisfactorily disposition
		EVT-1	Inspected Vertical and/or Radial Welds SV3B, SV3E, SV6A, SV6B and SV8B. Previous indications were observed in Welds SV6A and SV6B with no apparent change since R14.
		EVT-1	Linear indications (<1/2" length) were observed in the upper section of the shroud where the slot was EDM'd for the tie-rod bracket support. The indications are located at 8 out of 10 tie-rod locations. The indications were satisfactorily disposition as having no effect on the structural integrity of the load path between the shroud and the tie-rods for applied vertical or radial loads.
	2008 (RO18)	EVT-1	Inspected Vertical/Radial welds SV2B, SC3A, SV3C, SV3F, SV7B, SV7C and SV7E. Inspection included 100% of accessible area of the ID/OD. No relevant indications were noted.
		EVT-1	Re-inspected indications identified in RO-17 on the shroud ring segment in locations EDM'd for Tie Rod upper supports. No change was noted from RO17 results.
		EVT-1	Inspected previously recorded flaw on

			the shroud ID @ SH4 near SV5B. The inspection revealed no changes in size and configuration from the previous inspection in 2002. This inspection was performed per an INPO recommendation from the 2008 BWRVIP review visit to assist the industry in understanding the flaw mechanism-potentially irradiation – assisted corrosion cracking (IASCC).
	2010 (RO19)	EVT-1	Inspected Vertical/Radial welds SV2A, SV7A, SV7D, SV8A, SV8C, SV-9A, SV-9B and SV-9C. Inspection included 100% of accessible area of the ID/OD. No relevant indications were noted.
Shroud Support	1992 to present	UT or EVT-1	92 Outage: Inspected 0 and 180 deg access covers by UT. One planar indication detected at 180 deg, which is believed to be inherent to the fabrication process and is not ID connected. 94/95 Outage: Inspected 40" of H9 weld and accessible areas of 10 gusset plates used for tie-rod repair. 96 Outage: Inspected access hole cover at 0 deg, and inspected 36" of H9 weld and gusset plate welds at 3 tie-rod locations. No relevant indications noted.
	1998 (RO13)	EVT-1 VT-3	Baseline completed per BWRVIP-07 and BWRVIP-38 guidelines for all shroud repaired tie rods and load transfer gusset plate welds. *7 out of 10 tie rod assemblies inspected (by EVT-1/VT-3) in Fall 1998. No relevant indications noted. *All load transfer gusset plate welds and 12 inches of H9 weld each side of the gussets were examined by EVT-1. 7 out of 10 gussets inspected in RO13. No relevant indications noted. Examined by EVT-1 the access hole cover at 180 degrees. No relevant indications noted.

	2000/2002	N/A	No inspections during RO14 and RO15
	2004 (RO16)	EVT-1	Inspected two shroud support gusset plate welds and 12 inches of H9 top weld each side of the gussets. No relevant indications noted.
	2006 (RO17)	EVT-1	Inspected all ten shroud repair tie-rod systems and corresponding shroud support gusset welds at same locations. No relevant indications were noted. Inspected top portion of horizontal weld H9 at each side of tie-rod locations and between gussets at 180°. No relevant indications were noted.
		VT-1	Inspected the access hole cover at 180°, with no relevant indications noted.
	2008 (RO18)	N/A	No inspection performed in RO18
	2010 (RO19)	VT-3 EVT-1	Inspected (6) non-tie rod gussets locations plate welds and H9 weld on each side of the gusset at the same location. No relevant indications were noted.
		EVT-1	Inspected the access hole cover at 0 and 180°, with no relevant indications noted
Core Spray Piping	1987 to present	VT-3, MVT-1 or EVT-1	IEB 80-13 of piping and welds in annulus. One clamp repair in 1988 at cracked weld in "B" loop at 190 deg below upper elbow piping. Welds were brushed and inspected by EVT-1 per BWRVIP-18 in Fall, 1996. No relevant indications found.
	1998 (RO13)	EVT-1, MVT-1	Re-inspected 100% of loop "A" and "B" welds per BWRVIP-18 Guidelines (by EVT-1). No relevant indications noted, except for a rub-mark near CSA-10 weld. Support brackets were examined by MVT-1. No relevant indications noted.

	2000 (RO14)	EVT-1	Re-inspected all Loop "A" and "B" creviced and T-box-to-pipe welds, including repair clamp welds per BWRVIP-18 Guidelines (by EVT-1). A relevant indication was noted on weld CSB-12. No other relevant indications were noted.
	2002(RO15)	EVT-1	Re-inspected all Loop "A" and "B" creviced and T-box-to-pipe welds; repair clamp at Loop "B" downcomer pipe; and rotating sample of pipe elbow upper/lower welds in Loop "A" at 10 degrees. No relevant indications noted. Re-inspected the indication noted in RO14 on weld CSB-12. Level IIIs assessment is that the indication is now believed to be a scratch.
	2004 (RO16)	EVT-1	Re-inspected all Loop "A" and "B" creviced and T-box-to-pipe welds; repair clamp welds at Loop "B" downcomer pipe; and rotating sample of pipe elbow upper/lower welds in Loop "A" at 170 degrees. No relevant indications noted.
	2006(RO17)	EVT-1	Re-inspected all Loop "A" and "B" creviced and T-box-to-pipe welds; repair clamp welds at Loop "B" downcomer pipe , and rotating sample of pipe elbow upper/lower welds in Loop "B" at 190 degrees. Also, inspected all bracket support welds, including RPV side for Loop "A" and "B". No relevant indications noted.
	2008 (RO18)	EVT-1	Re-inspected all Loop "A" and "B" creviced and T-box-to-pipe welds; repair clamp welds at Loop "B" downcomer pipe; and rotating sample of pipe elbow upper/lower welds in Loop "B" at 350 degrees. No relevant indications noted
	2010 (RO19)	EVT-1	Re-inspected all Loop "A" and "B" creviced and T-box-to-pipe welds; repair

			clamp welds at Loop "B" downcomer pipe; and rotating sample of pipe elbow upper/lower welds in Loop "B" at 010 degrees. No relevant indications noted
Core Spray Sparger	1987 to present	VT-3, MVT-1 or EVT-1	IEB 80-13 of sparger and welds. MVT-1 and EVT-1 inspections per BWRVIP-18 in the Fall, 1996. An indication characterized as weld profile deficiency was recorded on spray nozzle D-28. Historical IVVI data was reviewed and the indication was previously noted and disposition as acceptable.
	1998 (RO13)	EVT-1, MVT-1	Re-inspected 100% of sparger piping "A" and "B" welds per BWRVIP-18 Guidelines (EVT-1/MVT-1) including tee boxes, end caps, drain welds, and support brackets. No relevant indications noted.
	2000 (RO14)		No inspections performed
	2002 (RO15)	EVT-1	Re-inspected all T-box and end caps to sparger pipe welds at Loops "A", "B", "C", and "D". No relevant indications noted.
		VT-1	Re-inspected Sparger "C" and "D" nozzle welds, and supporting brackets at "A" and "B". No relevant indications noted.
	2004 (RO16)	VT-1	Re-inspected all sparger bracket support welds at "C" and "D". No relevant indications noted.
	2006 (RO17)	EVT-1, and VT-1	Re-inspected by EVT-1 all T-box and end caps to pipe welds, and by VT-1 all bracket welds at spargers "A", "B", "C" & "D". Re-inspected by VT-1 all nozzle and drain to sparger welds at spargers "A" & "B". No relevant indications noted.
	2008 (RO18)	N/A	No inspections performed in RO18

	2010 (RO19)	EVT-1	Re-inspected by EVT-1 on all S1,S2 and S4, T-box and end caps to pipe welds, and by VT-1 all (SB) bracket welds at spargers "A", "B", "C" & "D". Re-inspected by VT-1 all nozzle and drain to sparger welds at spargers "C" & "D". No relevant indications noted.
Top Guide (Rim, etc.)	1988, 92 and 94/95	VT-3, and EVT-1	2 cells inspected in 1988 and in 1992; 4 cells in 1994. Additional inspections included, alignment wedges, hold down bolts, and rim welds at several locations (EVT-1 at rim welds in 94/95). No relevant indications noted.
	1998 (RO13)	N/A	No inspections performed
	2000 (RO14)	VT-1, and VT-3	A total of 4 hold down assemblies were examined by VT-1 and 3 alignment pin assemblies by VT-3 per BWRVIP-26 Guidelines. No relevant indications were noted.
	2002 and 2004	N/A	No inspections in RO15 and RO16.
	2006 (RO17)	VT-1 and VT-3	Inspected by VT-1 hold-down assemblies at 0 and 180 degrees (top only as below top guide is inaccessible). Inspected sampling of top guide surfaces by VT-1/VT-3. Also, inspected aligner pins at 0 and 180 degrees by VT-1. No relevant indications noted.
	2008 (RO18)	VT-1	Inspected by VT-1 hold-down assemblies at 90 and 270 degrees (top only as below top guide is inaccessible). Also, inspected aligner pins at 90 and 270 degrees by VT-1. No relevant indications noted.
	2010 (RO19)	EVT-1	Inspected by EVT-1 (8) grid beam cell locations, including plates and intersection locations as specified per BWRVIP-183. No relevant indications noted.
Core Plate (Rim, etc.)	1992 and 94	VT-3	Inspection at one core plate in 1992.

			Inspected approximately 25% of hold down bolting in 1994/95. No relevant indications noted.
	1998 (RO13)	VT-3	Inspected 100% of hold down bolting. No relevant indications noted.
	2000 (RO14)	VT-3	Inspected core plate plugs at 5 core locations. No relevant indications noted.
	2002 (RO15)	-	No inspections performed
	2004 (RO16)	VT-3	Inspected a total of 6 core plate plugs (at two locations). No relevant indications noted.
	2006 (RO17)	VT-3	Inspected core plate plugs and the surrounding core plate surface at four LPRM locations. No relevant indications noted.
	2008 (RO18)	VT-1	Inspected 33 core plate hold down bolt assemblies from 0-180 degrees with no indications noted.
		VT-1	Inspected 10 core plate plugs @ cell location 12-37, 28-29 and 36-37 to meet 10% sampling requirements. No indication noted, all plugs inspected were properly seated, with no evidence of movement.
	2010 (RO19)	VT-1	Inspected a total of 8 core plate plugs @ cell locations 28-21 and 28-37. No relevant indications noted.
SLC	2000 (RO13)	EVT-2	Performed Enhanced VT-2 on SLC nozzle-to-safe end weld during RPV System Leakage Test per BWRVIP-27 Guidelines. Test was "Accepted".
	2002/2004	EVT-2	Performed Enhanced VT-2 on SLC nozzle-to-safe end weld during RPV System Leakage Test per BWRVIP-27 Guidelines. Test was "Accepted".
	2006 (RO17)	PT	Performed liquid penetrant examination on SLC nozzle-to-safe end weld per

			BWRVIP-27 Guidelines with no recordable indications noted.
	2008 (RO18)	N/A	No Examination required based on 2006 inspection.
	2010 (RO19)	PT	Performed liquid penetrant examination on SLC nozzle-to-safe end weld per BWRVIP-27 Guidelines with no recordable indications noted.
Jet Pump Assembly	1987 to1994	VT-1,VT-3 and UT	Inspected all riser brace attachment welds by VT-1. No relevant indications but found debris at some weld locations. Have replaced all jet pump beams in 1992 because one exhibited indications of cracking by UT exam. Also inspected pump assembly, sensing lines, supports and diffuser to shelf welds, all by visual. No relevant indications but found debris at some weld locations. Cracking at a Japanese BWR of a Jet Pump riser weld prompted FitzPatrick to review IVVI tapes from previous refueling outages, including 1996 outage. Viewed accessible areas at two welds by VT-1, and at three welds by VT-3 examination. No cracking was found in the reviewed welds.
	1998 (RO13)	MVT-1, and VT-3	Inspected by MVT-1 50% of all Jet Pumps (#7 to #16) for component safety priority H (high) and M (medium), per BWRVIP-41 Guidelines. No relevant indications noted. Interferences in the annulus region restricted inspection of AD-1 and AD-3b welds. Inspected by VT-3 sensing lines/brackets at same jet pumps (#7 to #16). No relevant indications noted.
	2000 (RO14)	N/A	No inspections during RO14
	2002 (RO15)	EVT-1, VT-1, and VT-3	Completed inspection of Jet Pumps 5 and 6, and portions of Jet Pumps 19 and 20, with no relevant indications noted. Used

			inspections guidelines of BWRVIP-41 and 48. There are no MX-1 welds on the inlet-mixer, but there are IN-4 and MX-2 welds. Interferences in the annulus region (gussets) prevented inspection of the AD-3b welds.
		VT-1	Inspected Jet Pump Beams at #5, 6, 19 and 20, at locations recommended by BWRVIP-41, and by latest Operating Experience. No relevant indications noted.
	2004 (RO16)	EVT-1	Performed "High – priority" riser weld inspections at Jet Pumps #1, 2, 3, 4, 17 and 18. No relevant indications noted.
			Performed diffuser/adapter assembly weld inspections (Also "High"- priority) at Jet Pumps #17 and 18. No relevant indications noted.
		VT-1	Performed wedge bearing surface (WD-1) inspections at Jet Pumps #17 and 18. No relevant indications noted.
	2006 (RO17)	UT	Inspected all twenty jet pump beams with no relevant indications recorded.
			Inspected "High"- priority welds AD-1, AD-2, AD-3a, AD-3b, DF-2 and DF-3 at all 20 jet pumps (JP) with recordable indications at welds DF-2 (#JP 1 & 3) and AD-3b/DF-3 (#JP12 & 17). All indications were satisfactorily disposition for one operating cycle.
		EVT-1	Inspected "High"- priority welds DF-2 at JP #1 &3 and DF-3 at JP #17 based on UT results. No recordable indication noted.
		EVT-1	Inspected riser welds RS-1, RS-2 and RS-3 at JP #19/20 & RS-3 at JP #03/04. Also inspected RS-6, RS-7, RS-8, RS-9 and RB welds at JP #01/02, ¾, 17/18 &

			19/20 with no recordable indications noted.
		EVT-1	Inspected weld DF-1 at JP #01/02, ¾, 17/18 & 19/20 with no recordable indications noted.
		VT-1	Inspected wedge bearing surfaces (WD-1) at JP #1, 2, 3, 4, 19 & 20 with no relevant indications noted.
	2008 (RO18)	EVT-1	Inspected "Medium – priority welds IN-4 and MX-2 at JP # 1-4 & 17- 20 with no relevant indications noted.
		EVT-1	Inspected wedge bearing surfaces (WD-1) at JP # 7-12 & 20 with no relevant indications noted.
		VT-1/3	Inspected JP sensing line @ 1-4, 7-12 and 17-20, including bracket and attachment welds to diffuser with no relevant indications noted.
		EVT-1	Inspected the ID of JP 12 & 17 DF-3 welds to aid in evaluating previous indications identified by UT in RO17. No indications were noted visually from the ID and surface geometry appears normal with no undercut or root concavity noted.
	2010 (RO19)	EVT-1	Inspected RS-6, RS-7, RB welds at JP-7 thru 16 with no recordable indications noted.
		EVT-1	Inspected RB-1and 2, RB leaf to pad and Pad to vessel welds @ JP-7 thru 16 with no relevant indications noted.
		EVT-1	Inspected "Medium – priority welds IN-4, MX-2 and DF-1 at JP # 7-16 with no relevant indications noted.
		EVT-1	Inspected RS-8 and 9 welds on all Jet Pump as required per VIP mandate. No relevant indications were noted.

			Inspected WD-1 on Jet Pumps 1-6, 13-20 as required by VIP mandate with no relevant indications noted.
		EVT-1	Inspected RS1, 2, and 3 welds @ JP locations 7-16 with no relevant indications noted.
		UT	Re-Inspected "High"- priority welds AD-1, AD-2, AD-3a, AD-3b, DF-2 and DF-3 at all 20 jet pumps (JP) with Westinghouse JAMIS tool. Previous recordable indications at welds AD-3b/DF-3 (#JP12 & 17) were inspected and found to have no change in size from R17. Previous indications at DF-2 (#JP 1 & 3) were determined to be non-relevant. A new relevant indication was identified on JP # 8. All indications were satisfactorily disposition and bounded by previous evaluations.
CRD Guide Tube	1992	VT-3	Inspected stub tube to vessel and stub tube to housing welds for 9 tubes. No relevant indications.
	1998 (RO13)	N/A	No inspections performed.
	2000 (RO14)	EVT-1 and, VT-3	Inspected accessible surfaces at 3 Guide Tubes per BWRVIP-47 Guidelines. Inspected accessible surfaces at 8 Guide Tubes (VT-3). No relevant indications noted.
	2002 (RO15)	EVT-1 and VT-3	Inspected accessible surfaces at 4 Guide Tubes per BWRVIP-47 Guidelines. No relevant indications noted.
	2004 (RO16)	N/A	No inspections performed.
	2006 (RO17)	EVT-1 and VT-3	Inspected accessible surfaces at three Guide Tubes. No relevant indications noted.
	2008 (RO18)	N/A	No Inspections performed

	2010 (RO19)	EVT-1 and VT-3	Inspected CRGT-1, 2 and 3 accessible surfaces at 4 Guide Tubes per BWRVIP-47A Guidelines. No relevant indications noted.
CRD Stub Tube	1992	VT-3	See above.
	1998	N/A	No inspections during RO-13.
	2000/2002/ /2004/2006/ 2008/2010	N/A	No inspection requirements per BWRVIP-47 Guidelines.
In-Core Housing	1992	VT-1	No relevant indications.
	1998	N/A	No inspections during RO-13.
	2000 thru 2010	N/A	No inspection requirements per BWRVIP-47 Guidelines.
Dry Tube	1994	VT-1	No indications. Replaced all dry tubes in 1987/88.
	1998 (RO13)	N/A	No inspections performed.
	2000 (RO14)	VT-1	Inspected 4 IRM/SRM In Core Dry Tubes per GE SIL-409 and GE RICSIL-073 Guidelines. No relevant indications noted.
	2002 (RO15)	VT-1	Re-inspected SRM Core Dry Tube 20-17 per GE SIL 409 and GE RICSIL-073 Guidelines. No relevant indications noted
	2004 (RO16)	N/A	No inspections performed.
	2006 (RO17)	VT-1	Inspected dry tubes at three locations with no relevant indications noted.
	2008 (RO18)	VT-1	Inspected dry tubes at SRM locations 20-17, 28-41 and IRM location 20-25 per GE-SIL-409 Rev.2 with no relevant indications noted.
	2010 (RO19)	VT-1	Inspected dry tubes at SRM locations 36-25 and IRM location 12-33, 28-33, 36-09 and 12-09 per GE-SIL-409 Rev.2 with no relevant indications noted

Instrument Penetrations	1992	VT-1	Two inspected in 1992. No relevant indications noted.
	1998(RO13)	N/A	No inspections performed.
	2000(RO14)	VT-2	Performed VT-2 ISI System Leakage Exam Test at 6 instrument nozzles (during RPV System Test) per BWRVIP-49 Guidelines. Test was conducted to the extent possible with insulation installed and shield doors closed. Test was "Accepted".
	2002/2004/ 2006/ 2008/2010 (RO15-19)	VT-2	Performed a VT-2 leakage test at 6 instrument nozzles (same as in RO14-Fall 2000). Test was "Accepted" with no leakage noted.
Vessel ID Brackets	1987 to present	VT-1, VT-3, EVT-1 for core spray	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. Last inspection was Fall, 96 VT-3, or VT-1 if in beltline region. EVT-1 for core spray. No relevant indications noted.
	1998 (RO13)	MVT-1	Inspected Core Spray Brackets and Jet Pump Riser Brace Attachments per BWRVIP-48 requirements. No relevant indications noted.
	2000 (RO14)	N/A	No inspections in RO14
	2002 (RO15)	EVT-1	Inspected Jet Pump Riser Brace (at JP #5/6 and #19/20); and Feedwater Sparger Bracket Attachments (at all 8-locations), per BWRVIP-48 requirements. No relevant indications noted.
	2004 (RO16)	EVT-1	Inspected shroud support gusset plate welds to RPV wall at two locations, with no relevant indications.
		EVT-1, VT-3	Inspected all four steam dryer support brackets and attachment welds to RPV wall, with no relevant indications.

		VT-3	Inspected all four steam dryer hold-down brackets and attachment welds to RPV top head, with no relevant indications noted. Inspected guide rod and bracket to RPV weld at 180°, with no relevant indications noted.
	2006 (RO17)	EVT-1	Inspected all core spray piping support bracket welds to RPV wall, with no recordable indications noted. Inspected shroud support gusset plate welds to RPV wall at ten locations, with no relevant indications noted. Inspected riser brace leaf welds to RPV wall at JP #01/02, ¾, 17/18 & 19/20, with no recordable indications noted.
		VT-1	Inspected surveillance sample holder brackets upper and lower) at 030° and 120° to RPV wall, with no relevant indications noted.
		VT-3	Inspected guide rod and bracket to RPV weld at 000°, with no recordable indications noted.
	2008 (RO18)	N/A	No inspections performed
	2010 (RO19)	EVT-1	Inspected shroud support gusset plate welds to RPV wall at six locations, with no relevant indications noted Inspected riser brace leaf welds to RPV wall at JP #7-16, with no recordable indications noted Inspected all feedwater support brackets and attachment welds to RPV wall, with no relevant indications
LPCI Coupling	N/A	N/A	Not applicable to this plant.

Fuel Support Castings	1998 (RO13)	VT-3	Inspected accessible areas at fuel support castings during in-process control rod blade change-out. No relevant indications noted.
	2000 (RO14)	VT-3	Inspected accessible areas at fuel support castings during in-process control rod blade change-out. No relevant indications noted.
	2002 (RO15)	VT-3	Inspected accessible areas at four fuel support castings during in-process control rod blade change-out. No relevant indications noted.
	2004 (RO16)	VT-3	No inspections performed
	2006 (RO17)	VT-3	Inspected accessible areas at fuel support castings at four locations. No relevant indications noted.
	2008 (RO18)	N/A	No Inspections performed
	2010 (RO19)	N/A	No Inspections performed
CRD Nozzle NIR	1998 (RO13)	VT-1	The Control Rod Drive Nozzle Inner Radius was examined. No relevant indications noted.
	2000 (RO14)	EVT-1	Examined the CRD Nozzle Inner Radius, including adjacent vessel wall area. No relevant indications noted.
	2002-2008	N/A	No inspections in RO15 – RO18.
	2010 (RO19)	EVT-1	Examined the CRD Nozzle Inner Radius, including adjacent vessel wall area. No relevant indications noted.

Steam Dryer Moisture Separator	1998 (RO13)	VT-3	Inspected 25% of shroud head bolts at storage pit. No relevant indications noted.
	2000 (RO14)	VT-3 and EVT-1	Re-inspected by VT-3 all areas of the steam dryer support ring and by EVT-1 previously found cracks (1992/1994). A total of 10 indications were noted in 2000 (RO14), with no discernable changes from previous inspection.
	2002 (RO15)	N/A	No Inspections performed
	2004 (RO16)	VT-1 and VT-3	Inspected steam dryer integrity per SIL 644 Supplement 1 (steam dryer integrity) and INPO OE 18796 (steam dryer hood crack and tie bar recordable visual indications) guidelines. Two relevant indications areas were noted. These indications resulted in expanded scope with additional brushing and evaluations. These indications are in the HAZ of vibration block welds and at a drain channel. All indications were satisfactorily dispositions by calculations. Plans are to re-inspect the indications in RO17. Inspected steam dryer hold-downs and support brackets and attachment welds with no relevant indications noted.
		VT-3	Inspected steam separator lifting rod eye assemblies, and 25% of shroud head bolts with no relevant indications noted.
	2006 (RO17)	VT-1	Inspected selected welds on the steam dryer (per requirements of BWRVIP-139 over those recommended by SIL 644). A relevant indication was noted at the intersection of H-2 and V-7 welds (SW quadrant), and the weld was grind out and repaired in R17. Inspected previous relevant indications noted in R16 (i.e., at eight vibration

			block welds and at weld adjacent to drain channel weld #8) with no observed change noted since R16. The linear indication length at one vibration block was re-configured from the previous R16 reporting.
	2008 (RO18)	VT-1	Inspected previous relevant indications (i.e., at eight vibration block welds and at weld adjacent to drain channel weld #8) with no changed to indication size noted. Inspected R17 weld repair @ weld H2 & V7 intersection in SW quadrant with no relevant indications noted. Inspected upper support ring including previous indications noted in R14. 9 of the 10 previous indications have been determined to be scratches and are consider non relevant. No other indications were noted.
		VT-3	Inspected Shroud head bolts #10 thru 19 based on with no relevant indications noted.
		VT-1	Inspected 25% of upper and mid-support ring gussets on the moisture separator based on recent OE25795. A linear indication was noted on the # 5 upper gusset. Scope was expanded to include all upper and mid support ring gussets and linear indication were also identified on gusset # 6 upper and mid gussets. The indication were evaluated and found acceptable. Additionally during the gusset examination a broker tie strap was noted on the separator @ 0 degrees. The broken strap was removed per EC-10523 and evaluated for acceptance. Note: OE27679 was issued to inform the industry of the condition.
	2010 (RO19)	VT-1	Inspected previous relevant indications

			(i.e., at eight vibration block welds and at weld adjacent to drain channel weld #8) with no changed to indication size noted. Inspected R17 weld repair @ weld H2 & V7 intersection in SW quadrant with no relevant indications noted. Re-examined previous identified upper mid support gusset @ locations 5 and 6 with no change noted in size noted. Re-examined previously identified broken tie strap remnant @ 0 with no relevant condition noted Inspected Shroud head bolts #29 thru 36 based on OE 31414 with no relevant indications noted.
Surveillance Capsule Specimen Holder	2000 (RO14)	VT-1 and VT-3	Inspected at one location, the upper and lower mounting bracket (VT-1) and the condition of the specimen holder (VT-3) No relevant indications noted.
	2006 (RO17)	VT-1	Inspected upper and lower mounting bracket welds at 030° and 120°. No recordable indications noted.
	2008 (RO18) 2010 (RO19)	N/A	No inspections performed
Lower Plenum	2000 (RO14)	VT-1/3	Inspected by VT-3 accessible areas of lower plenum per BWRVIP-47 Guidelines. No relevant indications noted. Inspected by VT-1 accessible areas of bottom head drain. After removal of debris the area was re-examined and found acceptable.
	2002-2008		No access
Feedwater Sparger	2002 (RO15)	VT-3	Inspected Sparger pipe assembly at 45, 135, 225 and 315 degrees azimuth, sparger welds and end brackets. No relevant indications noted.
		VT-1	Inspected Junction T-box welds and Nozzle Inner Radius (NIR) at 45, 135,

			225 and 315 degrees azimuth. No relevant indications noted.
		UT	Inspected the NIR at all 4-locations. No relevant indications noted.
	2004 & 2006	N/A	No inspections performed
	2008 (RO18)	VT1/3	Inspected sparger brackets @ 45,135,225 and 315 degrees based on recent OE24382 for wear being identified. Brackets @ 45 and 135 were noted to have some wear noted around the pin. The condition was evaluated and found acceptable.
	2010 (RO19)	VT-3	Inspected Sparger pipe assembly at 45, 135, 225 and 315 degrees azimuth, sparger welds and end brackets. No relevant indications noted.
		VT-3	Inspected Junction T-box welds and Nozzle Inner Radius (NIR) Inspected the NIR at all 4-locations. No relevant indications noted.
		VT-1	Re-examined sparger brackets @ 45 and 135 deg. for wear noted in R18. No change was noted.
Dissimilar Metal welds	2004 (RO16)	UT	Performed UT on DM welds 24-10-131 and 24-10-132 and nozzle N-9-C1 overlay with no relevant indications noted.
	2006 (RO17)	UT	Performed UT on Nozzle to Safe End on the following welds with no relevant indications noted. N-1B-SE N-2H-SE N-2K-SE
	2008 (RO18)	UT	Performed UT on the Nozzle to Safe End on the following welds with no relevant indications. N-1A-SE N-2A-SE N-2B-SE

			N-2D-SE N-2E-SE N-2F-SE N-2G-SE N-2J-SE N-5A-SE N-8A-SE N-8B-SE Performed UT on Nozzle N-2C-SE and identified one axial indication approx ½" depth by ¾ wide. The indication was located on the butter to butter and was ID connected. Assumed the flaw to be IGSCC. The weld was overlaid and found acceptable.
	2010 (RO19)	UT	Performed UT on CRD return Cut and cap overlay with no relevant indication noted
		UT	Re-examined N-2C-SE overlay from R18 with no relevant indication noted.
FOSAR Examination	2008/2010	N/A	Scheduled 12 hr windows for cleaning and FOSAR inspection in annulus.

Reactor Internals Inspection History

Plant: **Hope Creek**

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

	RF06		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 R16	EVT-1	Examined all creviced weld locations, no indications
		EVT-1 & VT-3	Examined 25% header brackets, no indications.
Core Spray Sparger	Winter 1996 RF06	VT-1	Piping and spargers in shroud examined IAW IEB 80-13. No indications.
	Spring 1999 RF08	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
	Fall 2001 RF10	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
	Fall 2004 RF12	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
	Fall 2007 RF14	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
	Fall 2010 R16	EVT-1 VT-1	All sparger welds, no indications. 50% nozzle welds and all bracket welds, no indications.
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	Examined 4 top guide grid beam locations. No indications.

		VT-3	Examined 4 C-clamps, no indications
	Fall 2010 R16	EVT-1	Examined 4 top guide grid beam locations. No indications.
Core Plate (Rim, etc.)	Fall 1997 RF07	VT-3	Examined all hold down bolts, no indications.
	Spring 1999 RF08	VT-3	Examined 26 hold down bolts, no indications.
Jet Pump Assembly	Spring 1994 RF05	VT-1	50% riser braces, RB-1/2 & RS-8/9, no indications
		VT-3	100% wedges and setscrews IAW SIL 574. 3 screws with 1 tack cracked
	Winter 1996 RF06	VT-1	50% riser braces, RB-1/2 & RS-8/9, no indications
		VT-3	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 EVT-1 VT-1	100% wedges, no movement noted 100% RS-3, 50% RS-2, 50% RS6/7 50% IN-4, 50% MX-2, 50% DF-1/2, 50% AD1/2, 50%, no indications 50% sensing lines, no indications
	Fall 2004 RF12	UT VT-1 EVT-1	100% beams, BB1/2, no indications 50% sensing lines, no indications 25% RS-1, 50% RS-2, 50% IN-4, 50% MX-2, 50% DF-1/2, 50% AD1/2, 50% RS-6/7, no indications
	Spring 2006 RF13	VT-1 VT-1 EVT-1	50% sensing lines, no indications 100% wedges, one had minor wedge wear, installed slip joint clamp 25% RB-1/2, 25% RS-8/9, no indications
	Fall 2007 RF14	VT-1 VT-1 VT-1 UT	100% wedges, one had minor wedge wear and SS setscrew gap of 35 mil, installed auxiliary wedge 1 slip joint clamp, no issues 7 setscrew tack welds previously identified with cracks. One setscrew found with all tacks cracked. Staked setscrew, use as is one cycle without auxiliary wedge. 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 issue found. 11 sensing lines. No indications. Installed aux wedge for an issue found previous outage. 50% RS3, no indications.
	Fall 2010 R16	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.
CRD Guide Tube	Winter 1996 RF06 Spring 1999	VT-3 VT-3/1	Examined 6 guide tubes IAW Sec. XI. No indications Examined 4 guide tubes, no indications

	RF08 Spring 2003 RF11 Fall 2004 RF12 Fall 2007 RF14	 VT-3/1 VT-3/1 VT-1	 Examined 6 guide tubes no indications Examined 10 guide tubes, no indications Examined 5 guide tubes, no indications
CRD Stub Tube	Spring 94 RF05	VT-3	Examined IAW Sec XI. Examined CRD Housing through removed jet pump diffuser. No indications.
In-Core Housing	Not examined		
Dry Tube	Fall 1992 RF04 Spring 1999 RF08 Spring 2000 RF09	VT-1 EVT-1	Examined IAW SIL 409. No indications found. All 12 dry tubes had circumferential cracking approx 1 inch below the upper collar Replaced all 12 dry tubes
Instrument Penetrations	Fall 1997 RF07	VT-1 and VT-3	Examine IAW Sec. XI, no indications
Vessel ID Brackets	Winter 1996 RF06 Fall 1997 RF07 Spring 1999 RF08	VT-1 VT-1 VT-3 VT-1 EVT-1 VT-3	50% jet pump riser bracket, no indications 100% core spray header bracket, 50% jet pump riser bracket, 100% surveillance sample bracket, no indications. 100% guide rod bracket, 100% feedwater bracket, 100% steam dryer holddown bracket, no indications 25% core spray header bracket, 100% feedwater sparger bracket, 100% steam dryer support bracket, no indications. 50% jet pump riser bracket, no indications 100% guide rod bracket, no indications

	Spring 2000 RF09	VT-1 EVT-1	25% core spray header bracket, no indications 50% jet pump riser bracket, no indications
	Fall 2001 RF10	VT-1 VT-3	25% core spray header bracket, no indications 100% guide rods, no indications
	Spring 2003 RF11	EVT-1	25% core spray header bracket, no indications
	Fall 2004 RF12	EVT-1 VT-3	25% core spray header bracket, 100% steam dryer support bracket, 100% feedwater sparger bracket, no indications found. 100% guide rod bracket, no indications found.
	Spring 2006 RF13	EVT-1 VT-1 VT-3	25% core spray header bracket, 25% jet pump riser bracket, no indications 100% surveillance sample bracket, no indications 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 R16	EVT-1 VT-1	25% core spray header brackets. 2 Feedwater bracket pins where wear previously found. No discernable change.
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
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 coverplate
		VT-1	100% coverplates
		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 creator crack found on a lifting rod bracket weld. All indications were evaluated for use as is. No repairs required.
	Fall 2010 R16	VT-1	2nd re-baseline IAW BWRVIP-139 following 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.
RPV DM nozzle welds	Fall 2007 RF14	UT	Examined N2A, category C, automated UT. Found an 89.8% thru wall circumferential flaw and performed a weld-overlay repair. Expanded scope to examine N9, category C, manual UT and N2D, category C, automated UT. No indications found. Weld crowns ground flush for all three examinations. All three nozzles contain Alloy 82/182 weld material.
	Spring 2009 RF15	UT	Examined 8 category C welds with automated UT after weld crown reduction. Found embedded flaws on 3 welds, not ID surface connected. Evaluated IAW ASME section XI. No

			repair required.
	Fall 2010 R16	UT	Examined 5 category C welds after weld crown reduction; 2 by auto, 3 by manual. No indications found.

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 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 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 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 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 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 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	Performed VT-1, (1 mil wire) of sparger

		Air Test	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 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 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	NA	NA	NA
Jet Pump Diffuser	NA	NA	NA
SLC	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	No Inspection Performed.	Not made accessible.
	Fall 1994	No Inspection	Not made accessible.

		Performed	
CRD Guide Tube	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 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	No inspection Performed.	Not made accessible.
	Fall 1994	No Inspection Performed	Not made accessible.
In-Core Housing	Fall 2010	No Inspection Performed	Not made accessible.
	Fall 2008	No inspection performed.	Not made accessible.
	Fall 2006	No inspection performed.	Not made accessible.
	Fall 2004	No inspection performed.	Not made accessible.
	Fall 2002	No inspection performed.	Not made accessible.
	Fall 2000 Fall 1998 Fall 1996 Fall 1994	No inspection performed.	Not made accessible.
Dry Tube	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 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 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 Surv. Spec. 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	NA	NA	NA
Fuel Support Casting	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	Visual	None inspected.
	Fall 2004	Visual	None inspected.
	Fall 2002	Visual	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 findings.
Reactor DM Welds (BWRVIP-75-A)	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.
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 indentified.

			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.
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.
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.
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.
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.
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.
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.
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.
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
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.
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.
Dissimilar Metal Welds (BWRVIP-75-A)	2008	UT-E	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.