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2009-095 BWR Vessel & Internals Project (BWRVIP)

March 16, 2009

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

Attention: Joseph Williams

Subject: Project No. 704 – BWR Vessel and Internals Inspection Summaries for Spring 2008 Outages

Enclosed are five (5) copies of the document entitled "BWR Vessel and Internals Project, Vessel Internals Inspection Summaries for Spring 2008 Outages, March 2009."

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. Please note that the inspection summaries now include the results of the BWRVIP-75-A Dissimilar Metal Weld examinations. This information is being used by the BWRVIP to track the material performance of the associated vessel internal components. 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,

Rick Libra

Rick Libra
Exelon
Chairman, BWR Vessel and Internals Project

G004
NRR

Add'. Joseph Williams
to ERIDS

BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Spring 2008 Outages

March 2009

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Reactor Internals Inspection History

Plant: **Browns Ferry Nuclear Plant: Unit 3**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Result, Repairs, Replacements, Reinspections
Core Shroud	1994 1997 1998 2004	UT	Baseline (1994) per GE SIL No. 572 for circumferential seam welds - indications found in several welds (H-1, H-4, H-5). Reinspection (1997) per GE SIL No. 572 - indications found in H-7 weld along with previous indications. Full structural margins on flawed welds for at least one additional operating cycle. Vertical welds not inspected. Reinspection (1998): UT examination of H-1, H-2, H-3, H-4, H-5 performed. A total of 63 indications were recorded. A structural evaluation of H-3 was performed to support continued operation. Reinspection (2004) per BWRVIP-76: UT examination of H-5 performed (51.1 % coverage, 37 indications). Current plant-specific calculation allows continued operation through end of Unit 3 Cycle 12 Fuel Cycle (2006); new plant-specific calculation to be performed to support continued operation beyond that time. UT examination of H-6 (3.4 % coverage, no indications) and H-7 performed (2.2 % coverage, 1 indication); reinspection required in 2006 due to lack of coverage. Baseline (2004) UT inspection per BWRVIP-76 for Vertical Welds V-5 (61.6% coverage, no indications) and V-6 (61.6% coverage, no indications).
	2006	UT	Reinspection (2006) per BWRVIP-76:

			H-6 and H-7 were at the end of their inspection interval. UT examination of H-6 (24.41% coverage (one-sided), 0.0% flawed per examined weld length) and H-7 (19.44% coverage (one-sided), 3.27% flawed per examined weld length) was less than the BWRVIP-76 mandated 50% minimum due to mechanical and physical accessibility problems (e.g., RPV surveillance capsules, sensing lines, etc.) with the UT inspection equipment. Plant-specific evaluations demonstrated adequate structural margin exists for continued operation for one fuel cycle. Both Welds H-6 and H-7 will require reinspection using a two-sided UT technique during the U3C13 Refueling Outage in 2008. Attempts were made to examine Horizontal Welds H1 through H5 and Vertical Welds V6 and V7 one cycle before their inspection interval will expire. UT examinations (one-sided) of H-1 (75.62 % coverage, 5.65% flawed per examined weld length), H-2 (86.1% coverage, 1.28% flawed per examined weld length), and H-4 (15.92% examined, 3.24% flawed per examined weld length) were performed. Inspections of H-3, H-5, V-6, and V-7 were not performed. Plans are to reinspect Welds H1 through H5 using a two-sided UT technique during the U3C13 Refueling Outage in 2008. Welds V6 and V7 will be inspected using a one-sided UT technique during the U3C13 Refueling Outage in 2008.
	2008	UT	Reinspection (2008): UT examination of H1 (single-sided) and H2, H3, H4, H5, H6, H7, V5, and V6 (two-sided) performed per BWRVIP-76. The length of the weld inspected was at least 50 percent of the weld circumference in all cases. Flaws observed in five (H1, H2,

			H3, H4, & H7) horizontal welds and one vertical weld (V5) were less than 20 percent of examined length. Flaws observed in the H5 horizontal weld were less than 30 percent of examined length. Barring license renewal impacts, all horizontal welds with the exception of H5 will not be reinspected until 2018. The H5 weld (and associated vertical welds) will require reinspection in 2014.
Shroud Support	1994 1998 2000 2004	EVT-1, UT, VT-1	Manway cover (access hole cover) UT inspected during U3C6 Refueling Outage (1994) per the requirements of GE SIL No. 462. No reportable indications were found. Reinspection (1998): Both access hole cover exams (UT) performed with no reportable indications. Baseline (2000) EVT-1 inspection per BWRVIP-38 for Shroud Support Welds H-8 and H-9 at 0° and 180° locations. No reportable indications. Reinspection (2004) of access hole cover locations at 0° and 180° per GE SIL No. 462 R1 (EVT-1). No reportable indications were found. Reinspection (2004) of Shroud Support welds H-8 (EVT-1) and H-9 (manual UT) per BWRVIP-38, -104. No reportable indications were found.
	2008	EVT-1	Reinspection (2008) of Shroud Support weld H-8 (EVT-1) at 0° and 180° per BWRVIP-38. No reportable indications were found. Reinspection (2008) of access hole cover locations at 0° and 180° per GE SIL No. 462 R1 (EVT-1). No reportable indications were found.
Core Spray Piping	1994	EVT-1,	IEB 80-13/GE SIL No. 289 R1S2 of

	1997 1998 2000	UT, VT-1	piping and welds in annulus. Indications found during U3C6 Refueling Outage (1994) in T-box to pipe weld - both T-boxes repaired with brackets. (1997): Indications found during U3C7 Refueling Outage on welds P4d (two minor indications, total flaw length of 1.4 inches) and P8b (79% of total weld length) in Downcomer "C" piping. No other indications found. Reinspection (1998): UT and VT exams performed per VIP guidelines, no reportable indications. Lower section of "C" Downcomer replaced with bolted piping assembly. Reinspection (2000) per BWRVIP-18: EVT-1 visual inspections (piping bracket welds; P4d, P8a, P8b welds on "A", "B", "D" downcomers. No reportable indications. EVT-1 visual inspection of T-Box repair brackets, no indications. VT-1 visual inspection of "C" Downcomer lower section replacement, no indications.
	2002	UT, EVT-1	Reinspection (2002) per BWRVIP-18: EVT-1 visual inspections (T-Box welds). No reportable indications. UT examination of Downcomer "A" elbow welds and Downcomer "A", "B", "D" sleeve welds, no indications. EVT-1 visual inspection of T-Box repair brackets, no indications.
	2004	EVT-1, VT-1	Reinspection (2004) per BWRVIP-18: EVT-1 visual inspections (T-Box welds). No reportable indications. EVT-1 visual inspection of T-box repair brackets, no indications. VT-1 visual inspection of "C" Downcomer lower section replacement, no indications.
	2006	EVT-1,	Reinspection (2006) per BWRVIP-18-A:

	2008	UT, VT-1 EVT-1, VT-1	EVT-1 visual inspections (T-Box welds). No change in reportable indication on left side of T-Box at Azimuth 240°. No other reportable indications. UT examination of Downcomer "B" elbow welds and Downcomer "A", "B", "D" sleeve welds, no indications. Supplemental EVT-1 for Welds P4d, P8a, and P8b; no reportable indications. EVT-1 visual inspection of T-Box repair brackets, no indications. Reinspection (2008) per BWRVIP-18-A: EVT-1 visual inspections (T-Box welds, piping bracket welds), no reportable indications. No change in arc strike at 117°. No change in reportable indication on left side of T-Box at Azimuth 240°. EVT-1 visual inspection of T-box repair brackets at 120° and 240°, no reportable indications. VT-1 visual inspection of "C" Downcomer lower section replacement, no reportable indications.
Core Spray Sparger	1981-1997 1998 2000 2004 2008	EVT-1, VT-1	IEB 80-13/GE SIL No. 289 R1S1R1 of welds on sparger. Minor surface indications found. Reinspection performed in 1997 showed no change in indications. Reinspection (1998) performed, no new reportable indications. Reinspected (2000) per BWRVIP-18 with no reportable indications. Reinspection (2004) per BWRVIP-18: EVT-1 and VT-1 inspections of sparger welds, no reportable indications. Reinspection (2008) per BWRVIP-18-A: EVT-1 and VT-1 inspections of sparger welds and sparger bracket welds, no reportable indications.
Top Guide (Rim, etc.)	1994	EVT-1,	VT-1 performed per the

	1998 2000 2004 2008	VT-1	recommendations of GE SIL No. 554. No indications found. Reinspection (1998) at accessible beams and alignment pins. No reportable indications. Baseline EVT-1/VT-1 inspection (2000) per BWRVIP-26 with no reportable indications. Reinspection (2004) per BWRVIP-26: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no reportable indications. Reinspection (2008) per BWRVIP-26-A: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) inspected with no reportable indications.
Core Plate (Rim, etc.)	1994 1998 2000 2002 2004 2006	VT-1, VT-3	VT-1 (1994) performed per the recommendations of GE SIL No. 588. No indications found. Reinspection (1998) at accessible beams and alignment pins. No reportable indications. Reinspection (2000) per BWRVIP-25: Eighteen (18) of thirty-four holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Reinspection (2002) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Reinspection (2004) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Reinspection (2006) per BWRVIP-25:

			All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Seventeen (17) plugs were VT-3 inspected with no reportable indications.
	2008	VT-3	Reinspection (2008) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected from above with no reportable indications. Twenty-two (22) plugs were VT-3 inspected with no reportable indications.
SLC	Prior to 2006	VT-2	(Prior to 2006): Nozzle is leak checked every outage and volumetric exams are conducted per code requirement. No indications noted.
	2006	EVT-2	(2006): Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.
	2008	EVT-2	(2008): Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.
Jet Pump Assembly	1991-1997 1998	EVT-1, VT-1, VT-3	1994: VT-3 inspection of sensing lines per GE SIL No. 420, reinspection in 1997 - no indications in either inspection. All riser braces inspected in 1994 per SIL No. 551 - cracks found between riser and riser brace on Jet Pumps 5 and 6. Repair was conducted with installation of Jet Pump Riser Brace Clamp. 1997 reinspection for Jet Pumps 1-10 - no indications found. Jet pump adjusting screws inspected in 1991 per SIL No. 574 - no indications found. Reinspection in 1997 identified a minor indication on Jet Pump No. 6, shroud side, set screw tack weld. Set screw contact verified to be acceptable per GE RICSIL No. 078. Jet pump riser elbow circumferential welds (upper and lower) inspected in 1997 per GE SIL No. 605 R1 - no indications found. Jet pump beams replaced with beams manufactured from

			a modified heat treatment material in 1994. No inspection has been performed since the replacement. Baseline (1998) per BWRVIP-41: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, DF-1 (Jet Pumps 5 & 6), VT-1 of Medium Priority Location WD-1 (Jet Pumps 5 & 6), EVT-1 of High Priority Locations RS-3, DF-2, AD-1, AD-2, AD-3a, AD-3b (Jet Pumps 5, 6, 14, 15, 16); no reportable indications. VT-3 of Riser Brace Clamp repair (Jet Pumps 5 & 6), no reportable indications.
	2000	EVT-1, VT-1, VT-3	Baseline (2000) per BWRVIP-41: VT-3 of holddown beam locations BB-1 and BB-2 to verify proper function of beam (all 20 jet pumps) - no indications. EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, AD-3b (all jet pumps not examined in 1998); no reportable indications.
	2002	EVT-1, VT-1, VT-3	Baseline (2002) per BWRVIP-41: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, DF-1 (Jet Pumps 3, 4, 7, 8, 9, 10, 15, 16); no reportable indications. VT-1 of Medium Priority Location WD-1 (Jet Pumps 3, 4, 7, 8, 9, 10, 15, 16); inlet-mixer wedge off-center on Jet Pump No. 4, no other reportable indications. EVT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pump No. 4, indication observed on shroud-side set screw tack weld. Justification for continued operation (JCO) issued for continued operation of Jet Pump No. 4. VT-3 of Riser Brace Clamp repair (Jet Pumps 5 & 6), no reportable indications.
	2004	EVT-1, VT-1, VT-3	Baseline (2004) per BWRVIP-41: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, RS-7, RS-8, RS-9, IN-4,

			MX-2, DF-1 (remaining 10 jet pumps - 1, 2, 11, 12, 13, 14, 17, 18, 19, 20); no reportable indications. VT-1 of Medium Priority Location WD-1 (remaining 10 jet pumps plus Jet Pump No. 4); inlet-mixer wedge off-center on Jet Pumps 4, 19, and 20, no other reportable indications. VT-1 of Set Screw Locations AS-1 and AS-2 performed for same 11 jet pumps where WD-1 was examined per GE SIL No. 629; indication on shroud-side set screw for Jet Pump No. 4 not observed, 0.009-inch gap observed between vessel-side set screws and inlet-mixer bellyband for Jet Pump No. 20. JCO issued for continued operation of Jet Pumps 4, 19, and 20.
	2006	UT, EVT-1, VT-1, VT-3	Baseline (2006) per BWRVIP-41 R1, - 138: UT of holddown beam locations BB-1, BB-2, and BB-3 (Jet Pumps 1 thru 20) - no reportable indications. Reinspection (2006) per BWRVIP-41 R1: EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, AD-3b (Jet Pumps 11 thru 20) - no reportable indications. New baseline (2006) per BWRVIP-41 R1: EVT-1 of Medium Priority Locations RS-8 and RS-9 (Jet Pumps 1 and 2) - no reportable indications. VT-3 of Riser Brace Clamp repair (Jet Pumps 5 & 6), no reportable indications. Reinspection (2006) per BWRVIP-41 R1: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No wear noted; inlet-mixer wedge off-center but contact observed between wedge and restrainer bracket pad on Jet Pumps 2, 4, 5, 7, 8, 12, 13, 17, 19, and 20. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified six (6) set screw

			gaps greater ranging from 16 to 33 mils in width. Six (6) auxiliary wedges installed on Jet Pumps 4, 7, 10, 16, 18, and 20.
	2008	VT-1	Reinspection (2008) per BWRVIP-41 R1: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20) - No vibration-induced wear noted. Inlet-mixer wedge noted as slightly off-center but with no signs of wear or movement for Jet Pump 1. Inlet-mixer wedge off-center but unchanged since U3C12 RFO (2006) for Jet Pumps 2, 4, 5, 7, 8, 12, 13, 17, 19, and 20. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified four (4) set screw gaps greater ranging from 7 to 12 mils in width (below 15-mil screening criteria); no additional auxiliary wedges installed. Six (6) auxiliary wedges installed in 2006 inspected to verify contact; no reportable indications.
Jet Pump Diffuser	N/A	N/A	N/A
CRD Guide Tube	1994 2004 2006 2008	EVT-1, VT-3	Guide tubes vacuumed and inspected during U3C6 Refueling Outage - no reportable indications noted. Baseline (2004) per BWRVIP-47: 10 control rod guide tubes examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, MVT-1 visual examination of Locations CRGT-2 and CRGT-3; no reportable indications. New baseline (2006) per BWRVIP-47: 13 control rod guide tubes 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. Baseline (2008) per BWRVIP-47-A: 3 control rod guide tubes 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	N/A	N/A	N/A
In-Core Housing	N/A	N/A	N/A
Dry Tube	1994	VT	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 (2014).
Instrument Penetrations	2008	VT-2	Visual leak check is performed during each refueling outage. Bare-metal examination (enhanced VT-2) performed for DM welds (nozzle-to-safe end) associated with nozzles N11A&B, N12A&B, and N16A&B. No reportable indications.
Vessel ID Brackets	1997 1998 2000 2004 2006	VT-1 and 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 3-SI-4.6.G. No indications were recorded. Reinspection (1998): No reportable indications. Reinspection (2000): No reportable indications. Reinspection (2004): VT-3 visual examinations performed. Abnormal wear and a lap of smeared metal noted on lead-in to Steam Dryer Bracket at Azimuth 275°. Main bracket also shows some missing material on the right side. JCO issued to support return to service. Additionally, a retaining pin has dropped into the top plate on Feedwater Sparger End Bracket at Azimuth 185°. Disposition performed to leave as-is. No

			other reportable indications were noted. Reinspection (2006): VT-3 visual examination performed of Feedwater Sparger End Bracket at Azimuth 185°. Additional wear noted as the retaining pin had worn its way into the feedwater casting and would soon begin to wear into the vessel attachment bracket. A hardware repair for one-cycle was installed to mitigate further wear. This repair is currently being evaluated to determine if a permanent repair will be required during the U3C13 Refueling Outage in 2008.
	2008	VT-3	Reinspection (2008): VT-3 visual examination performed of eleven (11) undamaged Feedwater Sparger End Brackets. No wear observed under the retaining pin for the end bracket at all 11 locations. VT-3 visual examination performed for repair installed in 2006 on Feedwater Sparger End Bracket at 185°. Minor wear noted on bracket-to-repair clamp interface. Evaluation prepared by vendor allows operation for one cycle as-is. Reinspection during the U3C14 Refueling Outage in 2010 will be scheduled to determine if any additional wear is observed.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	1998 2002	VT-3	(1991): During Unit 3 Restart, cracking was found in 3 of 8 Unit 3 Steam Dryer Drain Channel to Skirt Attachment Welds. Repair of the cracked welds and reinforcement of all 8 welds for future mitigation performed. (1998): Welds associated with Drain Channel #1 (Azimuth 50°) were visually inspected (VT-3) in accordance with vendor requirements. No reportable indications were noted.

			(2002): Welds associated with Drain Channel #2 (Azimuth 130°) were visually inspected (VT-3) in accordance with vendor requirements. No reportable indications were noted.
	2004	VT-1, VT-3	(2004): The following locations were visually inspected (VT-1) in accordance with BWRVIP-139 and GE SIL 644 R1: • Horizontal and vertical welds which outline the steam dryer outer bank • Cover plate between the outer hood vertical plate and the support ring • Dryer manway @ 90° No reportable indications were noted. • Stabilizer/Tie Bars (original) - Visually inspected (VT-1) for damage; no deformation noted. • Stabilizer/Tie Bar repairs - Repairs made during U3C11 Mid-Cycle Outage in 2003 were visually inspected (VT-1) to verify that replacement tie bars and attachment welds were intact. No reportable indications were noted. The following locations were inspected in accordance with INPO OE: • Leveling screw tack welds @ 5° & 185° visually inspected (VT-1) - No reportable indications were noted. • Dryer surfaces visually inspected (VT-3) - Light Noble Metal coating observed in many areas, some with flaking of crud deposits (NRI). Welds associated with Drain Channel #3 (Azimuth 230°) visually inspected (VT-1) in accordance with BWRVIP-139. No reportable indications were noted.
	2006	VT-1, VT-3	(2006): The following locations were visually inspected (VT-1) in accordance with BWRVIP-139 and GE SIL 644 R1: • Weld seams associated with the outer side of the inner banks - No

			reportable indications. • Stabilizer/Tie Bars (original) - Visually inspected (VT-1) for damage; no deformation noted. • Stabilizer/Tie Bar repairs - Repairs made during U3C11 Mid-Cycle Outage in 2003 were visually inspected (VT-1) to verify that replacement tie bars and attachment welds were intact. No reportable indications were noted.
	2008	VT-1, VT-3	(2008): The following locations were visually inspected (VT-1) in accordance with BWRVIP-139 and GE SIL 644 R1: • Stabilizer/Tie Bars - No apparent change to deformation noted on tie bars between Banks 2 & 3 and 4 & 5: All 3 locations (0°, center, 180°). Evaluation performed to accept-as-is until Extended Power Uprate (EPU) implementation in 2010. Replacement tie bars between Banks 3 & 4 examined; no reportable indications. • Welds associated with Drain Channel #1, #2, #3, and #4 (Azimuths 50°, 130°, 230°, and 310°) visually inspected (VT-1) in accordance with BWRVIP-139. No reportable indications were noted. VT-3 visual examination performed of accessible steam dryer surfaces to look for potential damage as indicated by increased moisture carryover. No reportable indications were noted.
	2008	VT-1	Pre-EPU inspection of Steam Separator Standpipe Welds performed to look for fatigue cracking. Linear indication identified on the top of the Lower Gusset between Shroud Head Bolts #14 and #15. Engineering Evaluation allows operation for one cycle as-is with no repair

			required. Reinspection during the U3C14 Refueling Outage in 2010 will be scheduled to determine if the indication has changed.
		VT-1	Pre-EPU inspection of all 48 Shroud Head Bolts performed to look for wear in locking pin window and on mid-span and top support ring gussets. Material deformation noted on the indicator window of Shroud Head Bolt #42. Engineering Evaluation allows operation for one cycle as-is with no repair required. Reinspection during the U3C14 Refueling Outage in 2010 will be scheduled to determine if the indication has changed.

Reactor Internals Inspection History

Plant: **Brunswick Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud	1993	EVT-1 and UT	EVT-1 baseline. Indications in several circumferential welds and ring segment welds. No indications on vertical welds. UT selected areas on H1 and H5. Installed clamp repair on H2/H3. Full structural margins on non-repaired welds.
	1995	UT	Re-inspected H1 & H5 with no indication growth. 2 repair brackets inspected with no indications.
	1996	UT	Re-inspected H1 and H5 with no indication growth. UT baseline of H4, H6A, H6B and H7. No indications on H7. Minor indications on H4, H6A and H6B with no impact to structural margins. VT-1 and VT-3 inspected 3 repair brackets with no indications.
	1998	VT-1/VT-3	No inspections of welds was performed. Inspected 7 of 12 total shroud clamps with no indications. This completed the initial inspection of all 12 clamps installed in 1993.
	2000	UT/EVT-1/ VT-1/VT-3	Re-inspected H1 and H5 (UT) with no indication growth. Re-inspected (EVT-1) OD side of V1 and V2 with no indications. VT-1 and VT-3 inspected 3 repair brackets with no indications.
	2002	VT-1/VT-3	No shroud weld inspections were performed. Inspected 4 of 12 total shroud repair clamps with no indications noted.
	2004	VT-1/VT-3	Visually examined 2 shroud vertical welds and 4 of 12 total shroud repair

			brackets with no indications noted.
	2006	VT-1/VT-3	Visually examined 2 shroud vertical welds (V1 & V2) and 4 of 12 total shroud repair brackets with no indications/degradation noted.
		UT	Performed UT of Core shroud horiz. Welds H4, H6a, H6b, & H7 all of which are <10% cracked.
	2008	EVT-1	Core Shroud Vertical Welds V3, V4, V7, and V8 ID & OD. (NRI)
		VT-1/VT-3	Shroud repair clamps, 4 of 12 (NRI)
Shroud Support	1993	VT	VT of accessible areas on H8, H9, and access hole covers with no indications.
	1995	UT	UT baseline of H9 and VT reinspection of portions of H8 with no indications noted. VT-1 inspection of shroud support Access Hole Covers with no indications noted.
	1996	EVT-1	EVT-1 examination of Access Hole Covers with no indications noted.
	1998	EVT-1	Inspected Access Hole covers with no indications noted
	2002	EVT-1	Inspected both Access Hole Cover welds with no indications noted. Visually inspected approximately 18% of top side of H8 with no indications noted.
	2004	UT	UT 50% of H9 with no relevant indications noted.
	2006	EVT-1	Both Access Hole Covers – No indications noted.
	2008	EVT-1	H8 at 0 & 180 degrees (NRI)
Core Spray Piping	1980's to Present	MVT-1 and EVT-1	IEB 80-13 of piping and welds in annulus. One indication on the header piping. Full structural margins. Inspected per BWRVIP-18 in Spring

			1996 with no new indications.
	1998	EVT-1	Performed re-inspection of Core Spray piping and spargers per BWRVIP-18. No new cracking noted. Previous cracking had no significant length changes.
	2000	EVT-1	Performed re-inspection of Core Spray piping and spargers per BWRVIP-18. No new cracking noted. Previous cracking had no significant length changes.
	2002	EVT-1	Inspected 100% of the Core Spray piping creviced welds and 25% of the elbow welds per BWRVIP-18. No new cracking noted. Re-inspection of a previously identified crack showed some small increase in length.
	2004	EVT-1	Inspected 100% of the Core Spray piping creviced welds and 25% of the elbow welds per BWRVIP-18. No new cracking noted. Re-inspection of a previously identified crack showed no discernible change in length.
	2006	EVT-1 & UT	Inspected 100% of the Core Spray piping creviced welds and 25% of the elbow welds per BWRVIP-18-A. No new cracking noted except for the P3c-270 piping butt weld (unique to BNP-1). Additional cracking on the lower side of the weld prompted emergent UT to interrogate the entire circumference. Cracking extent estimated to be 80% of the Circ. Repair installed IAW BWRVIP-19-A and BWRVIP-84 requirements.
	2008	EVT-1	All P1, P2, P3, P5, P6, P7, P8 & 9 P4's 1 PB (NRI)
Core Spray Sparger	1980's to Present	MVT-1, EVT-1, and VT-3	IEB 80-13 of welds on piping and spargers. One indication on sparger T-Box. Inspected per BWRVIP-18 in Fall, 1996 with no growth in old indication and no new indications.

	1998	MVT-1, EVT-1, and VT-3	Re-inspected per BWRVIP-18 with no new indications. Previously identified crack had no significant length changes.
	2000	MVT-1, EVT-1, and VT-3	Re-inspected per BWRVIP-18 with no new indications. Previously identified crack had no significant length changes.
	2002	EVT-1, VT-1	Inspected sparger tee welds, sparger drain welds, sparger end cap welds and 25% of the sparger nozzle welds and support brackets in accordance with BWRVIP-18. No new indications were reported and no change was noted in a previously reported indication.
	2004	EVT-1, VT-1	Inspected 100% of sparger tee welds, 100% of the sparger end cap welds, 50% of the sparger drain welds, and 25% of the sparger nozzle welds and support brackets in accordance with BWRVIP-18. No new indications were reported and no change was noted in a previously reported indication.
	2006	EVT-1, VT-1	Inspected 100% of sparger tee welds. Existing crack on S2a-350 determined to be same length. Crack in a tack weld on a sparger nozzle was found and 100% sample expansion to all nozzle welds were performed per BWRVIP-18-A. Two additional cracked tack welds were identified.
	2008	VT-1 VT-1/VT-3	2 S1, 4 S2, 4 S4, 2 Noz tack welds 5 SB, Sparger Nozzles SN170-02c-53c, 1 SD (NRI) Newly installed repair clamp replacing S2a-350 and S2b-350 welds.
Top Guide (Rim, etc.)	1993-96	VT-1	VT-1 of 14 cells in 1993; no indications. 1996 re-inspected with no indications. VT-3 of wedges, holddown clamps, eccentric aligners, and general surface areas in 1993. One minor indication on

			eccentric aligner & dowel pin hole.
	2000	VT-1	VT-1 of 2 Hold Down assemblies with no indications noted.
	2004	VT-1	VT-1 of 2 Hold Down assemblies with no indications noted.
	2006	EVT-1	Inspected three (3) top guide grid beam intersections in conjunction with dry tube inspections at the same intersections. No indications noted.
	2008	VT-1 EVT-1	All 4 hold down latches 3 Grid Beam Intersections from 2 cells each (NRI)
Core Plate (Rim, etc.)	1993	VT-1	Holddown bolts from topside and partial surface areas. No indications.
	2004	N/A	No inspections performed in 2004.
	2006	UT	Inspected 100% of the core plate bolts using a plant specific methodology that determines bolt existence through the core plate support ring.
	2008	N/A	No inspections in 2008
SLC	1988	LP	No examinations performed on internal piping. Section XI LP performed on nozzle to safe end welds. No indications.
	2000	LP	Section XI LP performed on nozzle to safe end weld. No indications noted.
	2004	VT-2	Direct VT-2 examination of nozzle to safe end weld during system pressure test. No leakage noted.
	2006	VT-2	Direct VT-2 examination of nozzle to safe end weld during system pressure test. No leakage noted.
	2008	VT-2	Direct VT-2 examination of nozzle to safe end weld during system pressure test. No leakage noted.

Jet Pump Assembly	1993-96	VT-1	Riser brace brackets done once per period. Wedges, set screws, tack welds, sensing lines and sensing line supports VT per various SILs. Jet pump beams replaced in Fall, 1993. No indications noted, as well as in old jet pump beams. Transition areas inspected in 1995 with no indications.
	1998	EVT-1	Inspected all RS-1, RS-2 and RS-3 welds and associated draw beads. Cracks found on 3 risers with lengths ranging from 1-1/8" to 5-3/4". Analysis concluded structural margin acceptable for one cycle of operation. Inspected all 10 TS-3 welds (safe end transition piece to safe end extension) with no indications.
	2000	EVT-1	Inspected previously identified cracking on 3 RS-1 welds with no change in cracking.
	2002	EVT-1	Inspected 100% of hold-down beams, 25% of the IN-4 welds, 20% of the MX-2 welds, 20% of the WD-1 areas, 30% of the riser brace welds and re-examined the previously identified indications on the RS-1 welds of risers "D", "G" and "K". No new indications were noted and no significant changes were noted in the previously identified indications.
	2004	EVT-1	Inspected 25% of the IN-4 welds, 30% of the MX-2 welds, 80% of the WD-1 areas, 15% of the riser brace welds, 50% of the adapters welds AD-1 & AD-2, 35% of the restrainer RS-6 and RS-7 welds, 30% of the riser brace to riser pipe RS-8 & RS-9 welds, 60% of the riser elbow RS-1 welds and re-examined the previously identified indications on the RS-1 welds of risers "D", "G" and "K". No new indications were noted and no significant changes were noted in the previously identified indications.

	2006	UT & EVT-1 & VT-1	UT all Beams for BB-1 region. EVT-1 for all Beams for BB-2 & BB-3 regions for additional cycle due to tooling issues. No growth noted of cracking located in the Riser Elbows RS-1 welds D, G, & K. Also inspected RS-1, RS-1A, RS-2 & RS-3 on 2 Risers. Two RS-6, one RS-7, RS-8, & RS-9, three IN-4, three MX-2, , two riser braces, and VT-1 of all wedges WD-1. No additional indications noted
	2008	EVT-1	4 IN-4, 3 MX-2, 2 RB-2a,b,c,d 4 RS-1a, 2 RS-2, 2 RS-3, 2 RS-6, 3 RS-7,8,9 10 RS-1 **New RI's found on A & F risers.** No growth found on K riser.
		VT-1	2 WD-1 (NRI)
		UT	ALL Beams BB-1, 2a, 2b, 3a, 3b (NRI)
		VT-1/VT-3	2 newly installed repair clamps on JP Risers D & G (thermal sleeve to elbow welds)
Jet Pump Diffuser	start-up to present	VT-3	Adapter and diffuser welds inspected once per period. Last inspected in 1995 with no indications.
	1998	MVT-1	Inspected 20 of 40 DF-1 and DF-2 welds with no indications.
	2000	EVT-1	Inspected 10 AD-1 and AD-2 welds with no indications.
	2004	EVT-1	Inspected 50% of the DF-2 diffuser welds. No indications noted.
	2006	EVT-1	Inspected three AD-1 & AD-2, and three DF-1 & DF-2 welds
	2008	EVT-1	4 AD-1, 4 AD-2, 3 DF-1, 3 DF-2 (NRI)
CRD Guide Tube	1993	VT-3	Inspected accessible surfaces of approximately 75% of total population with no indications.

	2002	VT-1, VT-3	Inspected the CRGT-1, -2, -3 and FS/GT-ARPIN-1 components on seven guide tubes. No indications noted.
	2004	N/A	No inspections performed in 2004.
	2006	N/A	No inspection performed in 2006
	2008	EVT-1, VT-1, VT-3	Inspected the CRGT-1, -2, -3 and FS/GT-ARPIN-1 components on seven guide tubes. No indications noted.
CRD Stub Tube	1993	VT-3	Inspected accessible surfaces of approximately 75% of total population with no indications.
	2004	N/A	No inspections performed in 2004.
	2006	N/A	No inspections performed in 2006.
	2008	VT-3	9 stub tube to vessel welds (NRI)
In-Core Housing	Fall, 1993	VT	No indications noted.
	2004	N/A	No inspections performed in 2004.
	2006	N/A	No inspections performed in 2006
	2008	VT-3	9 stub tube to CRD housing welds (NRI)
Dry Tube	Fall, 1993	VT	No indications. Replaced in 1988. Scheduled for inspection in 2008.
	2004	N/A	No inspections performed in 2004.
	2006	VT-1	Inspected three dry tubes per SIL 409 in conjunction with top guide grid beam intersections. No indications noted.
	2008	VT-1	Inspected three dry tubes per SIL 409 in conjunction with top guide grid beam intersections. No indications noted.
Instrument Penetrations	1988 and 1995	LP	Inspections of external piping performed once per interval in accordance with ASME Section XI. No indications.

	2004	VT-2	Instrument nozzles were VT-2 examined as part of the RPV pressure test. No leakage noted. EVT-1/VT-3 exam performed on inner radius of Jet Pump instrumentation nozzles N8A & N8B.
	2006	VT-3	Inspected Inner nozzle radius. No degradation noted.
	2008	EVT-1/VT-3	Inner radius of N11a,b & N16a,b (NRI)
Vessel ID Brackets	1993-1996	VT-1 in beltline area; VT-3 other areas	Section XI inspections of core spray, feedwater sparger, dryer and surveillance capsule holder brackets performed once per interval. Last inspection Fall, 1996. No indications.
	2002	EVT-1/VT-1	Inspected 6 of 20 jet pump brace arm pad to RPV welds and 4 of 8 core spray header bracket to RPV welds. No indications were noted.
	2004	EVT-1/VT-1	Inspected 4 steam dryer hold down lugs, 2 of 8 Core Spray header bracket to RPV welds, 8 Feedwater End Bracket to RPV welds, 8 Jet Pump Riser Brace Arm to RPV welds, and 2 Surveillance Specimen Holder Bracket to RPV welds. No indications were noted.
	2006	EVT-1/VT-1	Inspected both guide rod brackets, two steam dryer support brackets, two surveillance specimen holder brackets, two jet pump riser braces, and one core spray piping support bracket (upper and lower). No indications were noted.
	2008	EVT-1 VT-1 VT-3	Core Spray Bracket @ 330 deg JP Riser Braces for H, J, & K risers (NRI) Lower Surv. Spec. bracket @ 300 deg. (NRI) Two (2) Steam Dryer Support Brackets Upper Surv. Spec. bracket @ 300 deg.

			(NRI)
Steam Dryer	3/2002	EVT-1/VT-3	Inspected two known cracks at SW-V4 & SW-V8. Inspected Guide Rod assy dryer bank 1 H4 and all four lifting eye rod supports. Also inspected upper support ring.
	9/2002	VT-3	Inspected overall condition of the steam dryer during B114M1 outage (partial uprate). No significant degradation noted.
	2004	VT-1	Baseline inspection of 100% exterior weld HAZ's. Repaired/replaced all upper tie bars. Added gusset plates to exterior banks 1 and 5. Reinforced welds of cover plates to upper support ring. Weld repaired most of the existing cracks.
	2005	VT-1	Mid-cycle outage inspected repairs and modifications.
	2006	VT-1	Inspected welds in accordance with BWRVIP-139, repairs, modifications, and outer bank areas.
	2008	VT-1	52 of 143 steam dryer welds. Numerous small cracking found on upper support ring- not significant. One previously repaired fatigue crack is cracked again- not significant at this time. Major crack found in lifting eye at 35 degrees. Installed repair this outage.
LPCI Coupling	NA	NA	Not applicable to Brunswick.
Dissimilar Metal Welds			
CAT A	2008	UT	N9 CRD Nozzle (1)
CAT B	-	-	None
CAT C	-	-	None
CAT D	-	-	Feedwater: N4C (3), N4D (3)

			Recirc: 28-A (3) , 28-B (4) Inst. Nozzle N8B (1)

Reactor Internals Inspection History

Plant: **Clinton Power Station 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 Horizontal Welds H1, H2, H3, H4, H5, H6A, H6B, and H7. Vertical Welds V11, V12, V13, and V14	4/2002 (C1R08)	UT	Performed UT of all Horizontal Welds. Coverage: Weld Number — % of Examined Length H1 — 59.7% H2 — 67.4% H3 — 66.7% H4 upper side — 100% H4 lower side — 97.1% H5 upper side — 19.0% H5 lower side — 18.7% H6A — 16.4% H6B — 25.6% H7 — 26.5% V11 — 95.2% V12 — 95.0% V13 — 87.0% V14 — 87.0% The following identify Flaws: Weld Number — % of Examined length Flawed H1 — 0% H2 — 0% H3 — 19.1% H4Upp — 97.2% H4Low — 74.0% H5Upp — 15.3% H5Low — 0% H6A — 0% H6B — 5.4% H7 — 0% V11 — 0% V12 — 0% V13 — 0% V14 — 0%

			Prior to startup an Engineering Evaluation was performed to justify continued operation for one cycle. Later on several other analysis performed as identified in VIP documents to document 2 cycles operation. This plan was presented to the NRC. Planning to implement a repair modification in 2/2006 (C1R010).
4 Tie Rods	2/2006 (C1R10)	Visual	4 Tie Rods installed in 2/2006(C1R10). Inspection performed as required by VIP-76.
Vertical Welds: V4, V5, V15, V16, V20, V21, V22, and V23	01/2008 (C1R11)	Visual	Performed Visual Examination of the following Vertical Welds. Coverage: <u>Weld Number</u> <u>% of Examined Length</u> V4 (OD only) 100 - Acceptable V5 (OD only) 10, (Inspected 100% accessible area, but because of out of correct angle due to this weld is right behind the LPCI line, except for the top area of the weld). Acceptable V15 (OD only) 10, Tie Rod limits access to the weld, changed 25% to 10%. V16 (OD only) 50, Top portion of the weld is hidden by Tie Rod. Acceptable V20 (OD only) 100 Acceptable V21 (OD only) 95 Acceptable V22 (OD only) 100 Acceptable V23 (OD only) 100 Acceptable
Detail inspection of 2 Tie Rods at 65 deg. and 245 deg	01/2008 (C1R11)	Detail Visual including	Tie Rod at 65 degrees Acceptable Tie Rod at 245 degrees Acceptable

		tightness verification	
General inspection of the remaining 2 Tie Rods at 155 and 335 deg	01/2008 (C1R11)	Visual inspection	Tie Rod at 155 degrees Acceptable Tie Rod at 335 degrees Acceptable
Shroud Support			
H8 and H9 Welds	10/2000 (C1R07)	EVT-1	EVT-1 of H8 and H9 welds for >10% length per VIP-38. No indications identified.
H9 Weld	2/2004 (C1R09)	UT	UT of H9 weld for 100% length from outside the Reactor wall. No indication was identified.
Access Hole Cover	2/2004 (C1R09)	VT-1	VT-1 of Access Hole Cover assembly per GE SIL 462. No indications identified.
H8 Weld	2/2006 (C1R10)	EVT-1	No indications identified.
Core Spray Baseline Inspection Core Spray Piping P2, P3A, P3B, P4A, P4B, P5, and P6.	10/2000 (C1R07)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and low Pressure core Spray piping systems. Two flaw indications, one on each BP2 and CP2 welds, were identified. Evaluated for 2 cycles operation per Core Spray Flaw Evaluation Handbook.
P4C and P4D.	10/2000 (C1R07)	EVT-1	No indications identified.
P8	10/2000 (C1R07)	VT-1	No indications identified.
Core Spray Spargers	10/2000 (C1R07)	EVT-1/VT-1 (as required)	No indications identified.
Re-Inspection Core Spray Piping P2's-all 4, P3A's-all	2/2004 (C1R09)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray

4, P3B-only 1, P4A-only 1, P4B-only 1, P5's-all 4, and P6-only 1.			and low Pressure core Spray piping systems. The two existing flaw indications, one on each BP2 and CP2 welds, were identified. These two flaws grew in length. Evaluated for 2 additional cycles of operation per Core Spray Flaw Evaluation Handbook. In addition, one more flaw indication on weld DP2 was identified. This flaw indication was also evaluated for two (2) cycles of operation. No other indications were identified.
P4c-only 1 weld P4d-only 1 weld P8-only 1	2/2004 (C1R09)	EVT-1	No indication was identified.
A-PR, A-ADR, A-BDR, B-PR, B-CDR, and B-DDR	2/2004 (C1R09)	EVT-1	No indication was identified.
Core Spray Spargers	2/2004 (C1R09)	EVT-1/VT-1 (as required) Auto UT and EVT-1	No indication was identified.
Re-inspection A-PR, A-ADR, A-BDR, B-PR, B-CDR, B-DDR	2/2006 (C1R10)	EVT-1	No indication was identified.
A-BP4c, A-BP4d, A-APB(PB1), A-BPB(PB2)	2/2006 (C1R10)	EVT-1	No indication was identified.
A-BP8	2/2006 (C1R10)	VT-1	No indication was identified.
<u>Re-Inspection</u> Core Spray Piping P2's-all 4, P3A's-all 4, P3B-only 1, P4A-only 1, P4B-only 1, P5's-all 4, and P6-	01/2008 (C1R11)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and low Pressure core Spray piping systems. The three (3) existing flaw indications, one on each BP2, CP2, and

only 1.			DP2 were identified. These three (3) flaws did not grow in last two (2) cycles. The previous evaluation for 2 additional cycles of operation is still valid per Core Spray Flaw Evaluation Handbook. No other relevant indications were identified.
A-PR, A-ADR, A-BDR, B-PR, B-CDR, and B-DDR	01/2008 (C1R11)	EVT-1	No indication was identified.
A-AP2, A-AP5, A-BP2, A-BP3B, A-BP6, B-CP2, and B-DP2	01/2008 (C1R11)	EVT-1	No indication was identified.
A-APB(PB1), A-BPB(PB2), B-CPB(PB3), and B-DPB(PB4)	01/2008 (C1R11)	EVT-1	No indication was identified.
B-CP8 – 187 deg	01/2008 (C1R11)	VT-1	No indication was identified.
Core Spray Spargers	01/2008 (C1R11)	EVT-1/VT-1 (as required)	No indication was identified.
Grinding marks and evidence of cold work (except for P3a and P5)	01/2008 (2008)	VT-1	No specific grinding marks or evidence of cold work identified.
Top Guide (Hold Down Assembly including Bolts and Nuts)	2/2004 (C1R09)	VT-3	Performed VT-3 of the Top Guide including Bolts and Nuts. No indication was identified.
Core Plate (Rim, etc.)	N/A	N/A	N/A
SLC	N/A	N/A	N/A

Jet Pumps High Priority welds RS-3 welds (50%).	10/2000 (C1R07)	EVT-1	Performed EVT-1 of High Priority welds. No indications identified.
RS-3 welds (remaining 50%)	2/2004 (C1R09)	EVT-1	Performed EVT-1 of remaining High Priority welds. No indications identified.
Medium Priority welds RS-1 welds (50%).	4/2002 (C1R08)	EVT-1	Performed EVT-1 of Medium Priority welds. No indications identified.
Inlet Mixer IN-1 and IN-2 welds (50%)	2/2004 (C1R09)	EVT-1	No indications identified.
Sensing Lines (50%)	2/2004 (C1R09)	VT-1	No indications identified.
Riser Brace RB-1a,b,c,d and RB-2a,b,c,d (50%)	2/2004 (C1R09)	EVT-1	No indications identified.
Riser Welds RS-2, RS-6, RS-7, RS-8, and RS-9 (50%)	2/2004 (C1R09)	EVT-1	No indications identified.
Wedge Bearing Surface WD-1 (50%)	2/2004 (C1R09)	VT-1	No indications identified.
Jet Pump Diffuser Welds AD-1, AD-2, DF-1, DF-2, and DF-3	2/2004 (C1R09)	UT	UT was performed on all welds of 100% Diffusers.
Wedge Bearing Surface WD-1 (4 each)	2/2006 (C1R10)	VT-1	No indications identified.
Jet Pump Beams Baseline	01/2008 (C1R11)	UT	No Indications identified.
Riser Brace	01/2008	EVT-1 &	No indications identified.

RB-1a,b,c,d and RB-2a,b,c,d (Remaining 50%)	(C1R11)	VT-1	
Riser Welds RS-1, RS-2, RS-6, RS-7, RS-8, & RS-9 (Remaining 50 %)	01/2008 (C1R11)	EVT-1	No indications identified. A gouge was identified outside the exam area of RS-1 JP #8.
Inlet Mixer Welds IN-1 & IN-2 (50%)	01/2008 (C1R11)	EVT-1	No indications identified.
Wedge Bearing Surface WD-1 (6 each)	01/2008 (C1R11)	VT-1	No indications identified.
Sensing Lines (50%)	01/2008 (C1R11)	VT-1	No indications identified.
CRD Guide Tube	4/2002 (C1R08)	EVT-1/VT-3 (as applicable)	11% examined (17) per VIP-47, CRDGT-1,2,3 and pin. No indications identified.
Dry Tubes 4 IRM	4/2002 (C1R08)	VT-3	Only 4 IRM's examined. No indications identified.
4 IRM and 4 SRM	2/2004 (C1R09)	VT-1	One indication identified on SRM 'D'. Evaluated for operating one cycle.
4 IRM, 1 SRM, and 4 LPRM.	2/2006 (C1R10)	VT-3	No indications identified.
SRM 'D'	2/2006 (C1R10)	VT-3	SRM 'D' dry tube was replaced in C1R10.
4 IRM	1/2008 (C1R11)	VT-3	No indications identified.
2 SRM	1/2008 (C1R11)	VT-3	One indication identified on SRM 'A'.
4 LPRM	1/2008 (C1R11)	VT-3	No indications identified.
Instrument Penetrations	N/A	N/A	N/A

Vessel Interior	10/2000 (C1R07)	VT-3	Section XI inspection. No indications identified.
	2/2004 (C1R09)	VT-3	Section XI inspection. No indications identified.
	01/2008 (C1R11)	VT-3	Section XI inspection. No indications identified.
Steam Dryer Hold Down Brackets	10/2000 (C1R07)	VT-3	Section XI inspection. No indications identified.
Steam Dryer Support Brackets	10/2000 (C1R07)	VT-3	Section XI inspection. No indications identified.
	2/2004 (C1R09)	EVT-1	Several Brackets have contact marks and several Brackets don't have contact marks. Clinton will be Monitoring this condition.
	2/2006 (C1R10)	EVT-1	No change in contact marks.
	1/2008 (C1R11)	EVT-1/VT-1/VT-3	No change in contact mark.
Guide Rod Support Brackets	10/2000 (C1R07)	VT-3	*Section XI inspection. No indications identified.
	2/2006 (C1R10)	VT-1	No indications identified. Guide rods and brackets were inspected to look for any damage caused by steam separator lower bracket.
Surveillance Sample Brackets	2/2004 (C1R09)	VT-1	Section XI inspection is SAT. However, both lower tack welds on 2 of the brackets found to be cracked. Evaluated for continued operation. Clinton will inspect these brackets in next refueling outage.
	2/2006	VT-1	Inspected brackets at 3 deg. and 177 deg.

	(C1R10)		and previously identified cracks. No change was observed.
	1/2008 (C1R11)	VT-1	Inspected brackets at 3 deg. and 177 deg. and previously identified cracks. No change was observed. Also inspected the third one located at 183 deg both upper and lower. No indications identified.
Steam Separator (1/2)	10/2000 (C1R07)	VT-3	N/A
Steam separator (1/2)	2/2004 (C1R09)	VT-3	One minor dent identified.
Lower Bracket @ 0 degrees	2/2006 (C1R10)	VT-3	Inspected previously identified dent/deformation. No change identified.
Steam Dryer			
Tie Rods	4/2002 (C1R08)	VT-3	Performed VT-3 of Steam Dryer Tie Rods. No indications identified.
Steam dryer Drain Channel #8 to the Skirt (V16)	4/2002 (C1R08)	VT-3	The existing crack on drain channel #8 to the skirt was measured 7 5/8". No change from the previous outages. This crack was identified in 1/1989 (C1R01). Clinton is monitoring this crack since C1R01. C1R08 is the baseline for this crack since Clinton will be operating at higher power after C1R08.
Steam dryer Drain Channel # 8 to the Skirt (V16)	4/2004 (C1R09)	VT-3	The existing crack on drain channel #8 to the skirt was measured 8 3/4". It grew 11/8"in one cycle. In C1R08 (4/2002) it was measured 7 5/8". This crack was repaired in C1R09 (2/2004) using under water welding.
Steam dryer All Banks, Cover plates, End panels, Hoods, Drain	2/2004 (C1R09)	Best Effort VT-1/VT-3	All welds were examined from outside. One minor dent was recorded. No other indications identified.

Channels, Skirt, Top and Tie Bars etc. from outside.			
Steam dryer All Banks, Cover plates, End panels, Hoods, Drain Channels, Skirt, Top and Tie Bars etc. from outside.	2/2006 (C1R10)	VT-1	All welds examined from outside. 1) An indication was observed in the drain channel base material, away from the weld. The indication appears to be a minor mechanical deformation. This indication was evaluated for continued operation. 2) Two (2) indications were observed in the dryer bank 5 horizontal weld H3. These indications are located under tie rods 28 and 30. They are 12.75" and 2.25" long. These indications were repaired by stop drill method. 3) A linear indication was observed in the dryer upper guide at 0 deg. This indication is 1.6" long. This indication was evaluated for continued operation. 4) Several linear indications were observed in the dryer upper support ring face. They are located at various locations and degrees. These were evaluated for continued operation.
Drain Channel Welds	2/2006 (C1R10)		Drain Channel welds were re-inforced from 1/8" to ¼" during C1R10.
Steam dryer All Banks, Cover plates, End panels, Hoods, Drain Channels, Skirt, Top and Tie Bars etc. from outside. Also, some portions were examined from inside.	01/2008 (C1R11)	VT-1	1) Examination was performed from the outside of the dryer. A base metal crack was observed adjacent to the drain channel 7, weld V-14. Another crack like indication was observed in the skirt adjacent to the V-6 weld, in the area of an access hole patch. Scope was expanded to perform examination from the inside the dryer.

			2) Examination was performed from the inside of the dryer using Firefly. The steam dryer inside area of the access hole patches were examined. The inspections observed several linear indications in the base material at all 6 access hole patches. Evaluated for continued operation. 3) The upper support ring was examined. Cracking was observed in the upper support ring at the location of 210 inside access hole patch. Evaluated for continued operation.
LPCI Coupling Loops 'A' and 'B' Except weld 6-6b's.	10/2000 (C1R07)	EVT-1	Performed EVT-1 of LPCI Couplings, both Loops 'a' and 'B'. No indications identified.
LPCI Coupling Loop 'C' except weld 6-6b.	4/2002 (C1R08)	EVT-1	Performed EVT-1 of LPCI Coupling 'C'. No indications identified.
Weld 6-6b's (all 3 loops)	2/2004 (C1R09)	EVT-1	Performed EVT-1 on all 3 loops. No indication was identified.
Re-inspection LPCI Coupling Loop 'A'	2/2006 (C1R10)	EVT-1	No indications identified.
Feedwater Spargers FW Sparger End Brackets	4/2002 (C1R08)	VT-3	Performed visual inspection of feedwater spargers per NUREG-0619. No indications identified.
	4/2002 (C1R08)	EVT-1	Performed EVT-1. No indications identified.
	1/2008 (C1R11)	VT-1	Performed VT-1 of End Brackets bolt Stops only. Evidence of movement and wear were observed on 4 out of 8 end bracket bolts. This condition was

			evaluated and accepted for continued operation.
VIP-75A – DM Cat 'D' Weld	1/2008 (C1R11)	UT	Performed UT of 5 'DM' welds. (FW- 4; JP Instrument –1). No indications identified.

Reactor Internals Inspection History

Plant: **Cooper Nuclear Station**

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

			welds H5, H6a, H6b, and H7 using phased array. Two sided examinations were performed on all welds except H7 that received a one-sided UT examination. Coverage was estimated at greater than 72% for welds H5, H6a, and H6b. H7 received greater than 53% coverage. A previously identified indication in H5 was re-examined with no apparent change. A previously identified indication in H6a was re-examined with no apparent change. A new minor indication was discovered in weld H6b in an area previously scanned in RE16 (1995). Two new minor indications were discovered in weld H7, one in a previously scanned location and the other in an area not previously scanned. Performed VT-3 examination of shroud per ASME Section XI, B-N-2 requirements. Discovered an indication approximately ten (10) inches long behind JP-19. Analyzed as acceptable. Performed first ASME required VT-3 successive examination of flaw discovered in base metal behind JP-19. No changes were in the indication.
	Spring 2008	VT	
Shroud Support	1993-1995	VT and UT	VT-1 of welds on 50% of core plate each outage. No indications. UT of Access Hole Covers in 1993. No indications.
	Spring 1997	VT	VT-3 on 50% of welds of core plate. No indications. VT-1 of access hole covers in accordance with GE SIL 462. No indications.
	Fall 1998	VT	VT-3 on 50% of welds of core plate. No indications. VT-1 of access hole covers in accordance with GE SIL 462. No indications.

	Spring 2000	VT	VT-3 on 50% of welds of core plate. No indications. VT-1 of access hole covers in accordance with GE SIL 462. No indications.
	Fall 2001	VT/UT	EVT-1: 17% of the H8 and H9 welds. No indications EVT-1: 6 gusset welds. No indications UT of Shroud access hole covers. No relevant indications.
	Spring 2003	VT	Examined welds on four (4 gussets.
	Spring 2005	UT	Examined greater than 10% of H9 weld with no indications.
	Fall 2006	VT	EVT-1 performed on approximately 16% of H8 weld length with no relevant indications. EVT-1 of AHC per SIL462.
	Spring 2008	VT	EVT-1 performed on accessible lengths of welds on seven (7) gussets.
Core Spray Piping	1980's to 1995	VT	IEB 80-13 exams of piping and welds in annulus. Three indications identified in Fall 1995 outage by EVT-1. No repair required.
	Spring 1997	UT/VT	Reexamined per BWRVIP-18 in Spring 1997 by UT. Only two indications. No repair required. Balance of piping EVT-1.
	Fall 1998	UT	Two indications Re-examined. No repair required. Balance examined by UT.
	Spring 2000	UT	Two indications Re-examined. No repair required.
	Fall 2001	UT/VT	31 of the CS piping welds were UT and 15 of the welds were EVT-1. Significant overlap of examinations. Indications

			included 1 – P8a weld, 2 – P8b welds, 3 – P9 welds, and 1 – P3 weld spot indication.
	Spring 2003	UT/VT	UT all P8a and P8b welds. Three (3) flaw indications on one P8b weld and one (1) flaw indication on one P8a weld. EVT-1: both junction box covers and accessible portion of P-1, 2-P2 welds, 4-P3 welds, 1-P4a weld, 1-P4b weld, 1-P4c weld, 1-P4d weld. EVT-1 all P8a and P8b welds. No additional indications. Note: Results are different from previous outage reports.
	Spring 2005	VT	The top and bottom surfaces of both P1's were examined by EVT-1. The examination revealed that the P1 weld is not a creviced weld. EVT-1 examinations were performed on both P2 welds, the four (4) P3 welds, the 4a – 4d welds at 190 degrees azimuth, and the P5's, P6's, and P7's, the four (4) P8a's, and the four (4) P8b's.
	Fall 2006	VT/UT	Performed UT examinations of P8b welds. Previous indications showed no change in size. Performed EVT-1 examinations of piping welds and bracket attachment welds. No new relevant indications observed.
	Spring 2008	VT	EVT-1 of indication near P1 at 90°. No change. EVT-1 of P1 at 270°. EVT-1 of P2's and P3's at 90° and 270°. EVT-1 of P4a, -b, -c, and -d at 170° EVT-1 of P5's, P6's, and P7's at 10°, 170°, 190°, and 350°.
Core Spray Sparger	1980's to 1995	VT/UT	IEB 80-13 of welds on sparger. No indications.
	Spring 1997	VT	Sparger and brackets inspected in

			accordance with BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C was found. No other indications.
	Fall 1998	VT	EVT-1 of sparger and brackets inspected in accordance with BWRVIP-18. Debris (wire) in C-sparger Nozzle 15C was reconfirmed. No other indications.
	Spring 2000	VT	EVT-1 of sparger and brackets inspected in accordance with BWRVIP-18. Five indications dispositioned as acceptable.
	Fall 2001	VT	EVT-1 of all S1, S2, and S4 welds examined with no indications. VT-1 of all S3a and S3b welds for the C Core Spray sparger. No new indications. VT-1 of one (1) S3c weld on the D sparger. No indications.
	Spring 2003	VT	VT-1 of CS Sparger A nozzle welds (S3a & S3b) and all CS sparger bracket welds. EVT-1 of CS Sparger A S1, S2, and S4 welds. CS Sparger B S1, S2, S4 and circumferential welds.
	Spring 2005	N/A	Sparger examinations deferred to fall 2006 (RE23).
	Fall 2006	VT	Sparger welds and brackets performed with no relevant indications.
	Spring 2008	VT	EVT-1 of S1's at 170° and 190°. EVT-1 of S2's at 170° and 190°. EVT-1 of S3a, S3b at 92° to 269°. EVT-1 of S3c at 99°. EVT-1 of S4's at 91° and 269°. VT-1 of SB's at 90°, 92°, 119°, 149°,

			210°, 241° and 268°.
Top Guide (Rim, etc.)	1991-1995	VT	VT of top guide beams of 50 cells was performed in 1991 per RICSIL 059. No indications. VT exams of the members in the load path between the top guide and core shroud in 1995 per SIL 588. One indication on the 90 degree aligner pin keeper was observed and evaluated as acceptable (indication not on load bearing portion of assembly).
	Spring 1997	VT	VT-1 re-examination of Top Guide Alignment Pin located at 90-degrees in accordance with SIL 588, R1. Indication on aligner pin keeper did not appear to change in size.
	Spring 2000	VT	VT-1 of hold down bolts per BWRVIP-26. No indications.
	Fall 2001	VT	VT-1 of horizontal Aligner Pins with no new indications. VT-1 of Hold Down assemblies. No indications. EVT-1 of 22% of Rim weld with no indications.
	Fall 2006	VT	VT-1 on two hold down assemblies with no indications. EVT-1 of two aligner pin assemblies. A previous indication identified on the non-load bearing keeper of the aligner pin assembly at the 90° location was observed with no apparent change. However, two new but similar type indications were also observed on the same keeper. Three new indications were observed on the non-load bearing aligner pin keeper at the 270° location. Indications were evaluated as acceptable.
	Spring 2008	VT	VT-1 performed on two hold down assemblies at 0 and 180°. VT-1 of horizontal aligner pin assemblies. One new indication identified on non-

			structural keeper at 180°. Similar to indications in keeper seen at 90° and 270°. Evaluated as acceptable. EVT-1 of accessible areas of Rim weld. VT-3 performed of top guide hold down assemblies, rim pins per B-N-2.
Core Plate (Rim, etc.)	Fall 1995 Spring 2000	VT VT	VT-3 of Hold down bolts examined in 1995 per SIL 588. No indications. VT-3 of 48 bolts examined from top side. *(Bolts were not accessible for EVT-1)
SLC	1986-2001 2003 Spring 2005 Fall 2006 Spring 2008	VT VT VT/UT VT VT	VT-2 exam of SLC penetration during RPV pressure test each outage. Enhanced VT-2 performed during Class 1 pressure test. Enhanced VT-2 performed in conjunction with ASME Section XI Class I hydrostatic test. Manual UT performed per Risk Informed Category RA (SLC-BJ-1). Enhanced VT-2 performed in conjunction with ASME Section XI Class I system leakage test. Enhanced VT-2 performed in conjunction with ASME Section XI Class I system leakage test.
Jet Pump Assembly	1986-1995 Spring 1997 Fall 1998 Spring 2000	VT/UT VT VT N/A	Ten (10) Jet Pumps VT examined each outage. Exam includes applicable GE SILS. Jet pump beams replaced in 1985. Jet pump beam UT performed in 1993. Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications. Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications. Exams deferred to Fall 2001.

	Fall 2001	VT	6 jet pumps with an additional 4 jet pumps with limited exams on the associated risers. No new indications. All 20 jet pumps. No new indications.
	Spring 2003	VT	JP's 1 through 10 EVT-1 beam transition area and AD-3b welds. VT-3 sensing lines and VT-1 bracket welds. Previous report cracked bracket weld determined not to be flawed. JP's 4 and 5 IN-4 weld JP's 11 through 20 EVT-1 beam transition area, RB-1a, RB-1c, RB-2c, RS-1 RS-2, RS-3 RS-6, RS-8, RS-9, In-4, MX-2 DF-1, DF-2, AD-1, AD-2, AD-3a, AD-3b. VT-3 JP sensing lines and VT-3 bracket welds. VT-3 inlet mixer. EVT-1 on all 20 JP BB-3 areas. UT of BB-1 & BB-2 all 20 jet pumps. No Indications.
	Spring 2005	VT	EVT-1 performed on the AD-1 weld for Jet Pump's (JP) 1, 2, and 5, the AD-2, AD-3a, AD-3b, DF-2, RS-1, RS-2, and RS-3 welds on JP's 1 and 2 and the IN-4 welds on JP's 7, 8, 9, and 10. VT-3 performed on the JP inlet nozzle and mixer regions for JP's 1 – 10 per SIL 465. EVT-1 performed on the restrainer bracket adjusting screw tack welds, gaps and supplemental wedges on JP's 2 and 10, and EVT-1 on tack welds and gaps on JP's 15 and 16 per SIL 574.
	Fall 2006	VT	EVT-1 performed on AD-1, AD-2, AD-3a, AD-3b, DF-1, DF-2, RS-1 and RS-2 for Jet Pumps 15, 16, 19, 20. EVT-1 performed on DF-1 for Jet Pumps 17 and 18. No indications observed.
	Spring 2008	VT/UT	VT-3 of JP nozzle inlets per SIL465 on JP

			19 and 20. VT-1 per SIL574 of adjustment screw and gap and tack welds on JPs 9, 10. EVT-1 of IN-4's at JP's 19 and 20. EVT-1 of RB-1a's, -1b's, -1c's, and -1d's between JP's 9/10 and 19/20. EVT-1 of RB-2a's, -2b's, -2c's, and -2d's between JP's 9/10 and 19/20. EVT-1 of RS-3 between JP's 19/20. EVT-1 of RS-6 at JP's 9 and 19. EVT-1 of RS-7 at JP's 10 and 20. EVT-1 of RS-8 and RS-9 at JP's 19/20 and 9/10. VT-1 of WD-1 at JP's 9,10,11, 15, 16, 19, and 20. UT BB-1, -2 and -3 of all 20 JP beams. UT of AD-1, AD-2, MX-2, DF-1, DF-2, and DF-3.All welds achieved 100% coverage except for AD-2 which achieved 87% volumetric coverage. ~2" flaw detected on JP-14 DF-1. Verified with visual exam from internal surface. Evaluated as acceptable.
Jet Pump Diffuser	1986-1998	VT	10 Jet Pumps VT-3 examined each outage. No indications.
	Spring 1997	VT	Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications.
	Fall 1998	VT	Ten jet pumps VT examined. Exam includes applicable GE SILs. No indications.

	Spring 2000	N/A	Exams deferred to Fall 2001.
	Fall 2001	VT	10 jet pumps (5 assemblies) with the only new indication being a broken jet pump sensing line upper bracket retaining weld.
	Spring 2003	N/A	See Jet Pumps.
	Spring 2005	N/A	See Jet Pumps.
	Fall 2006	N/A	See Jet Pumps.
	Spring 2008	N/A	See Jet Pumps
CRD Guide Tube	Fall 1995	VT	VT-3 exams of accessible guide tubes. No indications.
	Spring 1997	VT	VT-3 exams of accessible guide tubes. No indications.
	Fall 1998	VT	VT-3 exams of accessible guide tubes. No indications.
	Spring 2000	VT	EVT-1 of 4 guide tube welds per BWRVIP-47 and VT-3 exams of 10 guide tubes. No indications. VT-3 of anti-rotation pins at 8 locations per BWRVIP-47.
	Fall 2001	VT	Examined 13 anti-rotation pins and alignment lug welds. No indications. Examined 5 CRD Guide Tube CRGT-2 & 3 welds. No indications.
	Spring 2003	VT	Examined 16 guide tube interior surfaces, anti-rotation pins, and alignment lug welds. No indications.
	Spring 2005	VT	Examined CRD upper guide tube circ weld CRGT-2-(06-19) and lower guide tube circ weld CRGT-3-(06-19).
	Fall 2006	VT	VT-3 performed of CRGT and alignment pin at one location. EVT-1 performed on CRD upper guide tube circ weld CRGT-2 and lower guide tube circ weld CRGT-3 at one location. No indications observed.

	Spring 2008	VT	EVT-1 of CRGT-2 and CRGT-3 at 3 locations.
CRD Stub Tube	N/A	N/A	No record of examination.
In-core Housing	NA	NA	No record of examination back to 1996
Dry Tube	1989-1991	VT	VT exam in 1989, 1990, and 1991 per SIL409R1. All dry tubes replaced in 1993. Replaced one dry tube in 2005 (RE22)
Instrument Penetrations	1986-2008	VT	VT-2 performed during RPV system leakage test each outage.
	Spring 2000	PT	PT of one of the two instrument penetrations not exempt by ASME.
	Spring 2005	UT	UT of one of two penetrations in Risk-Informed Program.
Vessel ID Brackets	1986-1995	VT	ASME XI VT-3 exams (VT-1 if in the beltline region) of jet pump riser brace, dryer, FW Sparger, Core Spray, guide rod, and surveillance capsule holder brackets performed once per interval. No indications noted.
	Spring 1997	VT	10 jet pump riser brackets and welds examined. No indications.
	Fall 1998	VT	10 jet pump riser brackets and welds examined. No indications.
	Spring 2000	VT	Guide rod and FW Sparger Brackets and welds examined per BWRVIP-48. No indications
	Fall 2001	VT	Examined 3 Surveillance holder upper and lower bracket welds. No indications
	Spring 2003	VT	All FW sparger bracket attachment welds and all dryer support attachment welds. No indications
	Fall 2006	VT	Eight (8) FW sparger bracket and four (4) CS piping bracket attachment welds were

	Spring 2008	VT	examined with no indications. EVT-1 of JP riser brace pad attachment welds at 30, 150, 210, 270, and 330°. VT-3 of guide rod attachment welds. EVT-1 of Steam dryer support bracket attachment welds at 215 and 325°.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	Fall 2006	VT	Performed baseline VT-1 examinations to BWRVIP-139 and SIL 644, Rev 2. Re-examined five (5) minor indications previously identified per SIL 474 adjacent to several drain channels. Two new indications were observed in a weld adjacent to a drain channel and both tack welds on one lifting lug were observed. The indications were evaluated as acceptable.
Dissimilar metal welds	Spring 2008	UT	Automated UT performed on four (4) CAT A welds. Manual UT performed on 2 CAT A welds. All welds included in Risk-Informed Program. No indications.

Reactor Internals Inspection History

Plant: **Hatch Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud Horizontal Welds	Fall 1994 / 1R15	N/A	4-Tie Rods repair installed Fall 1994/1R15. No examination of horizontal welds H-1 through H-8 required.
	Spring 2006/1R22	UT	Examined H-1 through H-7 to prove structural integrity due to cracked shroud tie rod upper supports and 1 loose shroud tie rod. Significant cracking identified, but acceptable for one cycle. Future inspections unlikely pending future shroud repair corrective actions anticipated for 1R23.
	Spring 2008/1R23	UT	Examined H-5, H6a, H6b, and H-7 to prove structural integrity due to the inability to replace cracked shroud tie rod upper support at 225. Significant cracking identified, but acceptable for another cycle. Little growth in flaws from 2006 inspection.
Core Shroud Tie Rods (BWRVIP-07,1996)	Fall 1994 / 1R15	Tightness, EVT-1/VT-3	Installed 4-Tie Rods. Satisfactory.
	Spring 1996 / 1R16	Tightness, EVT-1/VT-3	Increased torque to all 4 Tie Rods. 1 at 315° found to be less than desirable load and was corrected. All others acceptable.
	Fall 1997 / 1R17	Tightness, EVT-1/VT-3	Tightness checks to all 4 Tie Rods. 1 at 315° was again found to be less than desirable load and was corrected. All others acceptable.
	Spring 1999 / 1R18	Tightness, EVT-1/VT-	Tightness check of 315° was found to be less than desirable, but acceptable. Tie

		3	Rod Nut Retainer slots bending from torque but acceptable, tightness procedure to be revised.
	Spring 2006/1R22	Tightness, EVT-1/VT-3	Tightness checks to all 4 Tie Rods. 1 at 315° was again found to be less than desirable load and was corrected. 2 cracked upper supports at 135° & 225°, one at 135° was replaced. Additional repairs and/or modifications to be performed next outage.
	Spring 2008/1R23	Tightness, EVT-1/VT-3	Replaced two tie rod upper supports at 135° and 315°. Unsuccessful in detensioning the Tie Rod nuts at 45° and 225°. 135° and 315° tie rod assemblies were restored to a condition acceptable for another cycle. Tie rod at 225° contains a flaw which grew at a rate less than predicted for the previous fuel cycle.
Core Shroud Vertical Welds (BWRVIP-07, 1996) (BWRVIP-63, 2000) (BWRVIP-76)	Fall 1994 / 1R15	EVT-1	EVT-1, 6" ID & OD at Horizontal Weld Intersection of H-4 & H-5. V-3, V-4, V-5, & V-6. Acceptable indications found on ID of V-4, and OD of V-5.
	Spring 1996 / 1R16	EVT-1	Baseline per BWRVIP-07 in 1996. EVT-1 Outside Surface of V-1 thru V-11, & Inside Surface of V-5 & V-6. Acceptable Indications in V-5, V-6.
	Fall 1997 / 1R17	UT	UT of 6 verticals in 1997, indications in V-5 & V-6, acceptable.
	Spring 1999 / 1R18	EVT-1	EVT-1, V-1 & V-2 from OD due to access. And V-3 through V-8 from ID & OD. Indications reported on V-4, V-5, V-6, & V-8. Acceptable. Future scheduling to be determined.
	Spring 2002 / 1R20	EVT-1	EVT-1, V-1, V-2 , V-9, V-10, & V-11 from OD. No Reportables. Schedule not to exceed 6 years.
	Spring 2004 / 1R21	UT/EVT-1	UT, V-5 & V-6 previous indications. No significant changes. Schedule not to

			exceed 10 years. EVT-1 of V-9, V-12, V-13, & V-14 from OD. No Reportables. Schedule not to exceed 6 years.
	Spring 2008/1R23	EVT-1	Examined V1, V2, V3, V4, V7, V8 V9, V10, and V11. Short indications recorded on the ID at the intersections of H4 with V4 and at the intersections of H5 with V7 and V8.
Core Shroud Ring Segment Welds (BWRVIP-07, 1996) (BWRVIP-63, 2000) (BWRVIP-76)	Spring 1996 / 1R16	EVT-1	EVT-1 from outside surface of 2 Ring welds. Satisfactory.
	Fall 1997 / 1R17	EVT-1	EVT-1 from outside surface of 4 Ring welds. 1- acceptable indication.
	Spring 1999 / 1R18	EVT-1	EVT-1 from outside surface of 5 Ring welds. No indications. Previous indication determined to be non-relevant. Future scheduling to be determined.
	Spring 2002	EVT-1	EVT-1 from OD of Top Guide RSW at 60 degrees. No Reportables. 1 of 4 Top Guide RSW every 2 cycles, or 4 years.
	Spring 2004	EVT-1	EVT-1 from OD of Top Guide RSW at 60 degrees, re-exam. No Reportables. 1 of 4 Top Guide RSW every 2 cycles, or 4 years.
	Spring 2006	EVT-1	EVT-1 from OD of Top Guide RSW at 120°. No Reportables. 1 of 4 Top Guide RSW every 2 cycles, or 4 years.
Core Shroud Support Ledge (H-9) (BWRVIP-38, 2000)	Fall 1994 / 1R15	VT-1/3	0-360° where accessible, from top once/interval. No indications. Future BWRVIP-38 scheduling to be determined. Very limited for EVT-1. 1R20?
	Spring 2004	EVT-1	4 Shroud Support Plate Gusset Welds at 12, 105, 195, & 285 degrees. No Reportables. Future scheduling to be determined.
	Spring 2006	EVT-1	EVT-1 of >10% of H-8 in order to establish redundancy to the degraded

			shroud repair (2 cracked upper supports at 135° & 225°). No reportables.
	Spring 2006	UT	UT of approximately 20% of H-9 per BWRVIP-104. No reportables
Core Shroud Support Ledge Access Hole Covers (2) 0° & 180°. (Augmented)	Fall 1992	UT	UT Indications. Acceptable for one cycle.
	Spring 1993 / 1R14	VT-1/3	Replaced with mechanical design in 1993. Typical for 2 at 0° & 180°. Examine one every outage / or 2 each period, VT-1 bolting tack welds/VT-3 remaining. No reportable indications.
	Fall 1994 / 1R15	VT-1/3	Examine each period. Examined 0°. No reportable indications.
	Spring 1996 / 1R16	VT-1/3	Examine each period. Examined 180°. No reportable indications.
	Fall 1997 / 1R17	VT-1/3	Examine each period. Examined 0°. No reportable indications.
	Spring 1999 / 1R18	VT-1/3	Examine each period. Examined 180°. No reportable indications.
	Fall 2000 / 1R19	VT-1/3	Examine each period. Examined 0° where evidence of leakage on the shroud side was observed. Examined 180° and found similar evidence of leakage. Determined that leakage is expected.
	Spring 2002 / 1R20	VT-1/3	Examine each period. Examined 180° evidence of expected leakage.
	Spring 2004 / 1R21	VT-1/3	Examine each period. Examined 180°. No reportable indications. Leakage not reported.
	Spring 2006/1R22	VT-1/3	Examine each period. Examined 180° evidence of expected leakage.
Core Spray Internal Piping	1980's to Spring	VT-1/.001mil	IEB 80-13/NUREG CR-4523. Examine each outage.

(BWRVIP-18, 1997)	1996 / 1R16	resolution	
	Fall 1997 / 1R17	EVT-1	BWRVIP-18 implemented 1997. No indications.
	Spring 1999 / 1R18	EVT-1	No indications.
	Fall 2000 / 1R19	EVT-1	No indications.
	Spring 2002 / 1R20	EVT-1	No indications.
	Spring 2004 / 1R21	EVT-1	No indications.
	Spring 2006/1R22	EVT-1	No indications
	Spring 2008/1R23	EVT-1	No indications
Core Spray Sparger (BWRVIP-18, 1997)	1980's to Spring 1996 / 1R16	VT-1/.001mil resolution	IEB 80-13/NUREG CR-4523. Examine each outage. Mechanical Repair Clamp on T-Box Cover Plate in 1984.
	Fall 1997 / 1R17	CSVT-1	BWRVIP-18 implemented 1997. No reportable indications.
	Spring 1999 / 1R18	EVT-1/VT-3	Began Sparger inspections as Geometry Critical. No reportable indications.
	Fall 2000 / 1R19	EVT-1/VT-3	No reportable indications.
	Spring 2002 / 1R20	EVT-1/VT-3	No reportable indications.
	Spring 2004/1R21	EVT-1/VT-3	No reportable indications.
	Spring 2006/1R22	EVT-1/VT-3	No reportable indications.
	Spring	EVT-1	No reportable indictions.

	2008/1R23		
Top Guide (BWRVIP-26, 1997)	Fall 1994 / 1R15	VT-1	VT-1 (.001) of Beams at 10 Cell Locations. & 4 - hold down bolts. EVT-1.
	Spring 1996 / 1R16	VT-1	4 Aligner Pins & Brackets, 4 Hold-down Brackets. No Indications.
	Fall 1997 / 1R17	VT-1	BWRVIP-26, 2 adjacent aligner pins. No indications. Accessible Rim Weld, VT-1. (EVT-1 required, no credit taken due to the in-ability to brush). No indications.
	Spring 1999 / 1R18	VT-1	2 adjacent aligner pins. No indications. Hold-downs no longer required due to GE evaluation.
	Fall 2000 / 1R19	VT-3	7 – grid areas (VT-3 ASME) during (CRB) Control Rod Blade replacement.
	Spring 2002 / 1R20	VT-1	VT-1, 2 of 4 Top Guide Hold-downs, 180 degrees apart, every other outage beginning 1R20.
	Spring 2004 / 1R21	VT-3	35 cell locations during CRB shuffle/exchange. No Reportables. Examinations scheduled when CRB's are shuffled/exchanged.
	Spring 2006/1R22	VT-1	VT-1, 2 of 4 Top Guide Hold-downs, 180 degrees apart every other outage. No indications. Also performed VT-1 of 2 cells from the underside. No indications.
	Spring 2008/1R23	EVT-1	Best effort examination of grid beams in 14 cells per BWRVIP-183. Flow due to thermals through Top Guide caused excessive camera motion for full EVT-1 credit.
Core Plate (BWRVIP-25)	Fall 1990 / 1R12	VT-1/3	VT-1 of Alignment Assembly (4). VT-1 Accessible Bolts from top surface. No reportable indications.
	Fall 1994 /	VT-1	VT-1 of Alignment Assembly (4). VT-1

	1R15		Accessible Bolts from top surface. No reportable indications.
	None	N/R	BWRVIP-25 examinations not required per Hatch configuration since installation of wedges during shroud repair in 1994. No future scheduling.
	Fall 2000 / 1R19	VT-3	7 – top surface areas during (CRB) Control Rod Blade replacement. Also, 8 – Core Plate By-Pass Flow Hole Plug. No reportable indications.
	Spring 2002 / 1R20	VT-3	14 – core plate top surface areas during Guide Tube Inspections. Also, 14 – Core Plate by-pass Flow Hole Plugs. No reportable indications.
	Spring 2004 / 1R21	VT-3	35 cell locations during CRB shuffle/exchange. Also 32 Core Plate By-pass Flow Hole Plugs. No Reportables. Examinations scheduled when CRB's are shuffled/exchanged.
	Spring 2006/1R22	VT-3	2 cell locations during CRB exchange. Also 4 Core Plate By-pass Flow Hole Plugs. No Reportables. Examinations scheduled when CRB's are exchanged.
	Spring 2008/1R23	VT-3	Examined 3 Core Plate Bypass Plugs
Standby Liquid Control (BWRVIP-27)	Fall 2000 / 1R19	Direct VT-2 or UT	Performed direct VT-2 during leakage test. No indications.
	Fall 2004 / 1R21	Direct VT-2 or UT	Performed direct VT-2 during leakage test. Access not suitable for UT. No indications.
	Spring 2006/1R22	Direct VT-2 or UT	Performed direct VT-2 during leakage test. Access not suitable for UT. No indications.
	Spring 2008/1R23	Direct VT-2	Performed direct VT-2 during leakage test. Access not suitable for UT. No

		or UT	indications.
Jet Pump Assembly (BWRVIP-41, 1999)	Through 1996 / 1R16	VT-1/3	ASME Riser Brace Arm Attachments. No Indications. Augmented SIL's/RICSIL's for Restrainer Adjusting Screw Tack Welds & Gap's. Riser Brace Arm to Riser Welds. Hold-Down Beams, Inlet mixers, Sensing Lines. Hold down beams replaced in 1990 due to UT indications.
	Fall 1997 / 1R17	VT-1/3 & EVT-1	All Thermal Sleeve to Risers welds, and some transition piece, diffuser, adapter examined 1997. Two indications that where reported in 1997 on the thermal sleeve to elbow welds HAZ's. Acceptable.
	Spring 1999 / 1R18	VT-1/3 & EVT-1	BWRVIP-41, intended to perform visual examination of all high priority welds, but could not perform EVT-1 examination of lower diffuser welds due to mainly gusset interference's. May perform UT on those welds next outage. UT examination of all Jet Pump Beam Bolts, no indications. Examined adjusting screw tack welds & gaps, 1 broken tack weld, and 4 set-screw gaps, worst one was .019" (no corrective action required). Additionally examined the restrainer wedge assemblies with the associated set-screw gaps (no reportable indications). Two indications that where reported in 1997 on the thermal sleeve to elbow welds had no significant change (took better measurements).
	Fall 2000 / 1R19	VT-1 & EVT-1	BWRVIP-41, made another attempt to perform EVT-1 examination of lower diffuser welds due to mainly gusset interference's. Re-examined adjusting screw tack welds & gaps, 1 broken tack weld, and 4 set-screw gaps reported during 1R18. No significant changes. One gap went away.

			Indications on the two thermal sleeve to elbow welds (EVT-1) that where first reported in 1997 and re-examined in 1999 had no significant changes. Nine of ten Riser brace arm to pad, and pad to vessel welds (EVT-1). No reportable indications.
	Spring 2002	EVT-1, VT-1	50% of the population of the medium priority items. Augmented 50% of the sensing line support brackets. No Reportables.
	Spring 2004 / 1R21	UT	UT was performed on 100% (20) AD-1, AD-2, & DF-2 welds due to inaccessibility for suitable visual inspection due to support plate gussets. No reportables.
		EVT-1	Indications on the two thermal sleeve to elbow welds (EVT-1) that were first reported in 1997 and re-examined in 1999 and 2000 had no significant changes.
	Spring 2006/1R22	UT	UT was performed on 20 Jet Pump Hold-down Beams - No indications.
		EVT-1	EVT-1 was performed on 50% of the RS-1, RS-2, RS-3 welds. Indications on the two thermal sleeve to elbow welds (RS-1's) that were first reported in 1997 and re-examined in 1999, 2000 and 2004 had no significant changes since 1997.
		VT-1	Re-baseline all 20 restrainer wedge bearing surfaces (WD-1) - No indications.
	Spring 2008/1R23	EVT-1/VT-1	Re-examined all wedges. Completed baseline of medium priority locations. Re-examined 50% of RB-1 locations. No reportable indications Re-examined RS-1 indications on JP 3/4

			and 7/8 with no change in length.
		VT-3	Examined sensing lines on JPs 7 and 17. No indications.
CRD Guide Tubes (BWRVIP-47)	Fall 2000 / 1R19	EVT-1 / VT-3	Tenative plans for inspections during 1R20 /Spring 2002. A FSC/GT Anti-Rotation Pin at 18-03 was reported as being loose in 1996. Was examined from the top side during 1R19, Fall 2000. Is welded from bottom.
	Spring 2002 / 1R20	EVT-1 / VT-3	EVT-1, 10% of the population (14) Guide Tubes CRGT-1, CRGT-2, & CRGT-3 welds, and VT-3 of FSC/GT Anti-Rotation Pins. Also examined applicable fuel support castings.
CRD Stub Tubes	None Required	VT-2	None scheduled (VT-2 during class 1 pressure test).
In-Core Housing	None Required		None scheduled
Dry Tubes	1987/1R10	N/A	Replaced with non-creviced design.
	Spring 2006/1R22	N/A	Replaced 6 (50%) dry tubes
	Spring 2008/1R23	N/A	Replaced remaining 6 (50%) dry tubes
Instrument Penetrations (BWRVIP-49)	Spring 1993 / 1R14	VT-2	Pin hole leak in 1993 was repaired.
	Fall 1994 / 1R15	PT/VT-2	No reportable indications.
	Fall 1997 / 1R17	PT/I/UT/VT-2	N10, N16A/B nozzles direct visual 1997. N10, N11A/B, N12A/B UT & PT in 1997. Examined during leakage test. No reportable indications.
	Spring 1999 / 1R18	VT-2	Future PT/UT may be exempt due to size/safety function/ and make-up capacity.

	Every Outage	VT-2	Future PT/UT exempt due to size/safety function/ and make-up capacity per Engineering. VT-2 every outage during class 1 leakage test.
*RPV Interior Attachments (BWRVIP-48) *Other Attachments examined by other BWRVIP documents.	Spring 1996 / 1R16 Fall 1997 / 1R17 Spring 1999 / 1R18	VT-1/3	Surveillance Specimen Brackets (3) No reportable indications.
	Fall 1997 / 1R17	VT-1/3	Guide Rod Brackets (2). No reportable indications.
	Spring 1993 / 1R14 Fall 1997 / 1R17	VT-1/3	Steam Dryer Support Brackets (4). No reportable indications.
	Fall 1994 / 1R15	VT-1	Steam Dryer Support Hold Down Brackets (4). No reportable indications.
	Spring 1999 / 1R18	VT-1/3	FW Sparger Brackets (4) every fourth outage per NUREG-0619 commitments. No reportable indications. Future scheduling to be determined.
	Spring 2002 / 1R20	VT-1, VT-3, EVT-1	VT-3, 2 - Guide Rod Brackets. VT-1, 1 - Upper Surveillance Specimen Bracket. VT-3, 1 - Lower Surveillance Specimen Bracket. EVT-1, 4 - Steam Dryer Support Brackets. EVT-1, 4 - Feedwater Brackets. No reportable indications.
	Spring 2004 / 1R21	VT-1	VT-1, 4 Steam Dryer Hold-down Brackets. No reportable indications. Each Interval.
	Spring 2006/1R22	EVT-1	EVT-1, 4 Feedwater Brackets to RPV. No reportable indications.
	Spring 2008/1R23	VT-3	1 Upper guide rod bracket to RPV, 3 upper surveillance specimen brackets to RPV.

		EVT-1	3 lower surveillance specimen brackets to RPV.
LPCI Coupling (BWRVIP-42)	Not Applicable to Hatch	N/A	N/A
Feedwater Spargers (NUREG-0619)	Fall 1994 / 1R15 Spring 1996 / 1R16 Fall 1997 / 1R17 Spring 1999 / 1R18	VT-1/3	Sparger Arms, Flow Holes, Brackets, Tees, Welds, Nozzle Blend Area. No reportable indications. Schedule 2 of 4 every outage per NUREG-0619 commitments. Future scheduling to be determined.
	Spring 2004/1R20 Spring 2006/1R22	VT-1/3	Sparger Arms, Flow Holes, Brackets, Tees, Welds. Unusual wear on end brackets to pins. Probable repair next outage. Schedule 2 of 4 every other outage beginning 1R20.
	Spring 2008/1R23	VT-3	FW Sparger end pins repair completed at four locations(185°, 265°, 275°, & 355°). Repaired due to wear.
Steam Dryer	Spring 2006 / 1R22	VT-1/3	Upper support ring @ 0^0-360^0 top and vertical surfaces VT-3. Lower & Upper Guide at 180^0 (10) Tie Bars TB1 – TB10, Vertical welds - Various Hood (8) Drain Channels DC1 – DC8 (5) Lower horizontal welds (2) Upper horizontal welds. One tie bar was cracked on one side on the middle span and was repaired (re-welded). Minor indications on DC-1 & Upper Support Ring. BWRVIP examinations are performed every other cycle until the BWRVIP determines an examination frequency. Other owner designated examinations are performed every 6 years.
	Spring 2008/1R23	VT-1 (89)	Upper support ring top and vertical surfaces 0-360°. Monitoring previously identified small indications. Flaws exhibited little discernable change.

			Lower support ring and guide 24" on either side of lower guide at 0°. Drain channel #1. Monitoring previously identified small indications. Flaws exhibited little discernable change. Reinspected tie bar #6, weld repaired during 2006
DM Welds	Spring 2008/1R23	UT	Performed manual UT of N9 nozzle cap weld and the "N8A" jet pump instrument nozzle-to-safe end weld. Both examinations met Appendix VIII criteria. The N8A nozzle-to-safe end weld examination detected no indications. Manual UT plots in the N9 cap weld indicated a potential flaw that appeared to extend upward from the root area along the interface of the replacement weld and the original nickel alloy butter fusion line. Phased array UT (Appendix VIII qualified) was then used to fully interrogate the weld and characterize the indication. The indication was evaluated to be a circumferentially oriented defect that was 2.3 inches long on the inside diameter and 60% through wall in a pipe thickness of 0.74 inches. A SWOL was successfully applied. Scope was expanded to the "N8B" jet pump instrument nozzle-to-safe end weld with no indications detected.

Reactor Internals Inspection History

Plant: **LaSalle 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Spray Piping	L1R12 (2008)	UT	Ultrasonic examination of 38 welds for which the UT technique is now demonstrated. Re-sized flaws on BP4a, DP5, and DP6 and due to new Demonstration, the flaws on DP5 and DP6 have been re-characterized as geometry-related; no flaws exist. Flaw evaluation performed on BP4a and weld scheduled for examination again in L1R14.
		EVT-1	Visual examination of those core spray piping welds for which UT technique is not demonstrated or where access is limited. No indications. Visual examination of five piping brackets. No indications.
	L1R11 (2006)	UT	Re-sized flaws on BP4a, DP5, and DP6. Flaw evaluation performed and welds scheduled for examination in L1R12.
		EVT-1	Visual examination of those core spray piping welds for which UT technique is not demonstrated. No indications.
	L1R10 (2004)	UT	Ultrasonic examination of 34 welds for which the UT technique is demonstrated. Re-sized flaws on BP4a, DP5, and DP6. Flaw evaluation performed and welds scheduled for examination in L1R11.
		EVT-1	Visual examination of those core spray piping welds for which UT technique is not demonstrated. No indications.
	L1R09 (2002)	EVT-1	Visual examination of those core spray piping welds for which UT technique is

			not demonstrated. No indications.
	L1R08 (1999)	UT	Ultrasonic examination of the welds for which the UT technique is demonstrated. Re-sized flaws on BP4a, DP5, and DP6. Flaw evaluation performed and welds scheduled for examination in L1R10.
		EVT-1	Visual examination of those core spray piping welds for which UT technique is not demonstrated. No indications. Visual examination of 50% of the core spray sparger welds. No indications.
Core Spray Sparger	L1R12 (2008)	EVT-1	Visual examination of 25% of the core spray sparger welds. No indications. Visual examination of four sparger brackets. No indications.
	L1R11 (2006)	EVT-1	Visual examination of 50% of the core spray sparger welds. No indications.
	L1R10 (2004)	EVT-1	Visual examination of 50% of the core spray sparger welds. No indications.
	L1R09 (2002)	EVT-1	Visual examination of 50% of the core spray sparger welds. No indications.
	L1R08 (1999)	EVT-1	Visual examination of 50% of the core spray sparger welds. No indications.
Attachment Welds	L1R12 (2008)	EVT-1	Visual examination of 12 feedwater sparger attachment welds, both the upper and lower surveillance capsule welds at three locations. No indications.
		EVT-1	Visual examination of four steam dryer support lug attachment welds. No change in the wear on the steam dryer support lugs at 5° and 185° where previous wear was observed.
	L1R11 (2006)	EVT-1/VT-1/VT-3	(See jet pump and core spray sections for those attachment welds.) Visual examination of 2 guide rod attachment welds, 12 feedwater sparger attachment welds, and both the upper and lower

			surveillance capsule welds at three locations. No indications.
		EVT-1	Visual examination of the steam dryer support lug at 185° where wear was observed last outage. No change in the wear.
	L1R10 (2004)	EVT-1/VT-1/VT-3	(See jet pump and core spray sections for those attachment welds.) Visual examination of 4-steam dryer support lug welds, 2 feed water sparger attachment welds, and both the upper and lower surveillance capsule welds at three locations. The steam dryer support lug at 185° showed signs of wear and was accepted for one cycle.
	L1R08 (1999)	EVT-1/VT-1	(See jet pump and core spray sections for those attachment welds.) Visual examination of 4 steam dryer support lug welds. No indications.
Core Shroud	L1R11 (2006)	UT	UT of welds H3, H4, H6, and H8 (LaSalle-specific numbering). Coverage on H6 and H8 was less than 50%, and a site-specific flaw evaluation was performed and re-inspection is in 6 years. Note that 100% of the accessible areas were not examined, and a Deviation Disposition was submitted. Indications were less than 10% on each weld.
	L1R07 (1996)	UT	UT of welds H3, H4, H5, H6, and H8 (LaSalle-specific numbering). No indications noted except on H4, where indications were 3.0%. Next inspection in 2006.
Shroud Support	L1R12 (2008)	EVT-1	Visual examination of both access hole covers. No indications.
		EVT-1	Visual examination of 8 shroud support plate gusset welds. No indications.
	L1R11 (2006)	EVT-1	Visual examination of 8 shroud support plate gusset welds. No indications.

		VT-3	Visual exam of 100% of the accessible portion of the top of H9 and both access hole covers. No indications.
	L1R10 (2004)	EVT-1	Visual examination of 11shroud support plate gusset welds. No indications.
		EVT-1	Visual examination of approximately 20% of H8a. No indications.
	L1R09 (2002)	UT	Ultrasonic examination of 100% of the H9 weld from the vessel outside diameter. No indications.
	L1R08 (1999)	EVT-1	Visual examination of 6 shroud support plate gusset welds. No indications.
		EVT-1	Visual examination of approximately 2% of H8a, 23% of the top of H9, and both access hole covers. No indications.
	L1R07 (1996)	VT-1	Visual examination of both access hole covers. No indications.
SLC	L1R12 (2008)	VT-2	Visual examination during the system leak test. No indications.
		PT	Surface examination. No indications.
	L1R11 (2006)	VT-2	Visual examination during the system leak test. No indications.
	L1R10 (2004)	VT-2	Visual examination during the system leak test. No indications.
		PT	Surface examination. No indications.
	L1R09 (2002)	VT-2	Visual examination during the system leak test. No indications.
	L1R08 (1999)	VT-2	Visual examination during the system leak test. No indications.
Jet Pump Assembly	L1R12 (2008)	UT	UT of 14 hold down beams at BB-1, BB-2 and BB-3. Indication found at BB-3 on Jet Pump 18 and beam replaced.

		VT-1	Visual examination of 9 auxiliary wedges. One indication on Jet Pump 16; accepted as is. No other indications.
		VT-1	Visual examination of WD-1 on 10 pumps. New indications noted on jet pumps 8 (an auxiliary wedge was installed) and on jet pump 11 (accepted as-is).
		EVT-1	Visual examination of 8 DF-2 welds. No indications.
		VT-3	Visual examination of 5 slip joint clamps. No indications.
		VT-1/VT-3	Visual examination of 2 riser brace clamps installed in L1R11. No indications.
		VT-3	Visual examination of the inside of the diffuser on jet pumps 19 and 20. No indications.
	L1R11 (2006)		The hold-down beams on jet pumps 5, 6, 9 and 10 were proactively replaced with low stress beams.
		EVT-1	Visual examination of RB-2 welds on 6 pumps. NRI.
			Installation of riser brace clamps on the risers for jet pumps 5/6 and 9/10 to repair the RS-9 flaws identified in L1R10.
			The slip joint clamps on jet pumps 5, 6, 9 and 10 were upgraded to a new style.
		VT-3	Visual examination of the 16 old style slip joint clamps installed in the previous outage. No indications.
		EVT-1	Visual examination of RB-1 on 12 jet pumps and RB-2 on 6 jet pumps. No indications.

		VT-1	Visual examination of WD-1 on 20 jet pumps. No change in the wear identified in L1R10.
		EVT-1	Visual examination of RS-3 on 5 pumps. No indications.
	L1R10 (2004)	UT	BB-1, BB-2, and BB-3 areas of all 20 hold-down beams. Indications at BB-1 on Jet Pump 15 resulted in replacement of this beam with a low stress beam. When the inlet mixer for Jet Pump 19 was replaced, the beam was proactively replaced.
		EVT-1	Visual examination of RS-3 on 5 risers. No indications.
		VT-3	Best effort examination of the inaccessible welds AD-1, AD-2, and DF-3 on all 20 jet pumps. No indications.
		EVT-1	Visual examination of DC-3 on 8 pumps. No indications.
		EVT-1	Visual examination of DF-1 on 11 Jet Pumps. No indications.
		EVT-1	Visual examinations of DF-2 on 2 Jet Pumps. No indications.
		EVT-1	Visual examination of RS-1 welds on all 10 risers. No indications.
		EVT-1	Visual examination of RS-2 welds on 5 risers. No indications.
		EVT-1	Visual examination of RS-3 on 5 risers. No indications.
		EVT-1	Visual examination of RS-6 and RS-7 on 10 jet pumps. No indications.
		EVT-1	Visual examination of RS-8 on all 20 jet pumps. No indications.

		EVT-1	Visual examination of RS-9 on all 20 jet pumps. Indications found on 3 jet pumps (5, 6 and 9). Flaw evaluation performed and required the installation of a repair in L1R11.
		EVT-1	Visual examination of IN-1 on 11 jet pumps. No indications.
		EVT-1	Visual examination of IN-2 on 11 jet pumps. No indications.
		EVT-1	Visual examination of MX-2 on 11 jet pumps. No indications.
		EVT-1	Visual examination of RB-1 on 19 of the jet pumps. No indications.
		EVT-1	Visual examination of RB-2 on 18 jet pumps. No indications.
		VT-1	Visual examination of WD-1 on 20 jet pumps. Wear identified on 10 jet pumps. Wear accepted as-is on 9 jet pumps; inlet mixer for jet pump 19 replaced with a different inlet mixer.
		VT-1	Visual examinations of 10 auxiliary wedges installed in previous outages. No indications. Installed auxiliary wedges at the following vessel side locations: jet pumps 4, 12, 13, 14, 15, 16, and 19. Installed auxiliary wedges at the following shroud side locations: jet pumps 1, 3, 4, 12, 14, and 16.
		EVT-1	Visual examination of the strain relief welds on the 10 risers. No indications. Slip joint clamps were installed on all 20 jet pump inlet mixers.
	L1R09	VT-3	Visual examination of WD-1 on 4 jet

	(2002)		pumps. No indications. Installed auxiliary wedges at the following vessel side location: jet pump 6. Installed auxiliary wedges at the following shroud side location: 11.
		VT-1	Visual examination of 2 auxiliary wedges installed in previous outages. No indications.
	L1R08 (1999)	UT	UT of 10 jet pump beams at the BB-1 and BB-2 locations. No indications.
		EVT-1	Visual examination of DF-1 on 10 Jet Pumps. No indications.
		EVT-1	Visual examinations of DF-2 on 10 Jet Pumps. No indications.
		EVT-1	Visual examination of RS-1 welds on 5 risers. No indications.
		EVT-1	Visual examination of RS-2 welds on 5 risers. No indications.
		EVT-1	Visual examination of RS-3 on 5 risers. No indications.
		EVT-1	Visual examination of RS-6 and RS-7 on 10 jet pumps. No indications.
		EVT-1	Visual examination of RS-8 on 10 jet pumps. No indications.
		EVT-1	Visual examination of RS-9 on 10 jet pumps. No indications.
		EVT-1	Visual examination of IN-1 on 10 jet pumps. No indications.
		EVT-1	Visual examination of IN-2 on 10 jet pumps. No indications.
		EVT-1	Visual examination of MX-2 on 10 jet pumps. No indications.

		EVT-1	Visual examination of RB-1 on 10 of the jet pumps. No indications.
		EVT-1	Visual examination of RB-2 on 10 of the jet pumps. No indications.
		VT-3	Visual examination of WD-1 on 20 jet pumps. Due to wear observed in L1R07, the inlet mixer on jet pump 9 was replaced and the wedge was oversized, and the restrainer bracket was machined to accommodate the larger wedge. To prevent flow imbalance, the inlet mixer on jet pump 10 was proactively replaced. Auxiliary wedges installed at the following vessel side locations: jet pumps 1, 5, 7, 8, and 10. Auxiliary wedges installed at the following shroud side location; jet pumps 6.
		VT-1	Gaps at the vessel side set screw were identified on 1 pump and accepted without installation of an auxiliary wedge for one cycle. Gaps at the shroud side set screw were identified on 1 pump and accepted without installation of an auxiliary wedge for one cycle. The temporary auxiliary wedges installed on the vessel and shroud side of jet pump 9 were replaced with permanent auxiliary wedges. The wear on WD-1 was accepted for another cycle.
	L1R07 (1996)	VT-3	Visual examination of WD-1 on 2 jet pumps with wear observed on jet pump 9. Flaw evaluation determined acceptable for one cycle.
		UT	UT of all 20 jet pump holddown beams at BB-1; one indication on #9 beam; beam replaced.
		VT-1	A gap was identified on the vessel side

			set screw of jet pump 9, and temporary wedges were installed at both setscrews on jet pump 9.
LPCI Couplings	L1R12 (2008)	EVT-1/VT-3/VT-1	Visual examination of four locations on one coupling (135°). No indications.
	L1R10 (2004)	EVT-1/VT-3/VT-1	Visual examination of four locations on all three couplings. No indications.
	L1R08 (1999)	EVT-1/VT-3/VT-1	Visual examination of four locations on all three couplings. No indications.
Lower Plenum	L1R11 (2006)	VT-3	Areas below the core plate made accessible due to the removal of the inlet mixers for jet pumps 5, 6, 9 and 10. Areas include CRD/ST-1, bottom of H9, and ICH/RPV-1. No indications.
	L1R10 (2004)	VT-3	Areas below the core plate made accessible due to the removal of the inlet mixer for jet pump 19. Areas include CRD/ST-1, bottom of H9, and ICH/RPV-1. No indications.
	L1R09 (2002)	VT-3/EVT-1	Visual examination of the fuel support guide tube pins (FS/GT-ARPIN-1) at 20 locations, CRGT-1 at 20 locations, CRGT-2 at 21 locations, and CRGT-3 at 21 locations. No indications.
	L1R08 (1999)	VT-3	Visual examination of the fuel support guide tube pins (FS/GT-ARPIN-1) at 19 locations, the CRGT-1 at 19 locations. No indications.
Steam Dryer	L1R12 (2008)	VT-1	All welds on the half of the dryer between 0° and 180°, including drain channels, tie bars, vertical welds, horizontal welds, and tie rods on both sides of the dryer. New indications were identified on TB-03, TB-08, TR-05-270, TR-05-90, TR-06-270, TR-06-90, TR-09-270, TR-09-90, TR-10-270, TR-10-90, TR-13-270, TR-13-90, TR-14-270, TR-14-90, TR-16-90, TR-17-270, TR-17-90, TR-18-270, TR-18-90, V04a-90,

			V04c-90, V05-90, V06-90, V09-90, V10-90, V13-90, V14-90, V15-90, V17-90, and upper support ring between 90-180. All were evaluated and accepted without repair.
		VT-3	General inspection of the half of the dryer between 180° and 360° above the waterline. No indications.
	L1R11 (2006)	EVT-1	Re-inspection of lower guide bracket at 180° and hood A plate 5 where previous indications existed and were stop drilled. No new indications.
		VT-1	All welds on the half of the dryer between 180° and 360°: access hole cover, drain channels, vertical welds and horizontal welds. No new indications. Indications at V13-270 and V14-170 were re-examined and there was no growth.
	L1R10 (2004)	VT-3	Visual exams on the end panels and welds; one indication on bank B, bank 2 which was stop drilled, and one previous indication on bank D bank 4 and there was no growth. All four lifting lugs and their brackets (previous indications at five locations with no growth), 100% of tie rods (10 previous indications unchanged), 100% of tie bars
		VT-1	Visual examination of upper and lower guide brackets with an indication on the lower guide at 180° which was stop drilled, all horizontal welds, all horizontal plates (hood A plate 5 indication was stop drilled), hood F plate 1 (previous indication did not grow), 100% of the tie bars
Top Guide	L1R12 (2008)	VT-3	Visual examination of two c-clamps; no indications.
	L1R10	VT-3	Visual examination of two c-clamps; no

	(2004) L1R08 (1999)	 VT-3	indications. Visual examination of four c-clamps; no indications.
Vessel	L1R12 (2008)	VT-3	Inspection of the general condition of the RPV interior surface from the RPV closure flange elevation to the Steam Dam, 360° around the RPV interior. NRI. Inspection of the general condition of the RPV interior surface at the shroud support plate elevation above the gussets, 360° around the RPV interior. NRI.
	L1R10 (2004)	VT-3	Inspection of the general condition of the RPV interior surface from the RPV closure flange elevation to the Steam Dam, 360° around the RPV interior. NRI. Inspection of the general condition of the cladding at the Steam Dam elevation, 360° around the RPV interior. NRI. Inspection of the general condition of the RPV interior surface from below the core plate to the shroud support plate. NRI.
	L1R09 (2002)	VT-3	Inspection of the general condition of the RPV interior surface from the RPV closure flange elevation to the Steam Dam, 360° around the RPV interior. NRI. Inspection of the general condition of the cladding at the Steam Dam elevation, 360° around the RPV interior. NRI.
DM Welds- BWRVIP-75-A	L1R12 (2008)	UT	There were no dissimilar metal welds examined this outage.

Reactor Internals Inspection History

Plant: **Limerick Generating Station, 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	1994 (1R05)	VT-3	VT-3 examination of OD of welds H-1, H-2, H-3, H-4, H-5, H-6, and H-7. No indications identified.
	1996 (1R06)	UT	Baseline Category "B" UT examinations of welds H-3, H-4, H-5 and H-7 per BWRVIP-01, Rev. 1. Minor indications identified on H-3. No indications identified on H-4, H-5 and H-7.
	2006 (1R11)	UT & EVT-1	Category "B" welds were re-examined by UT. Due to the identification of cracking, the scope was expanded and the shroud reclassified as a Category "C". All horizontal welds except H1 were UT examined from two sides using Phased-Array on most ring (H2 LKUP, H3 LKDN and H6 LKDN) locations. Recently demonstrated H1 emersion technique looking down was not successful. Vertical welds V-15, 16, 17 and 18 in the beltline screened-in and were UT examined from ID. Vertical welds V-7 and 8 at the top guide and V-25 and 26 below the core plate also screened-in and were visually (EVT-1) examined from the shroud OD.
Shroud Support	1987 (1R01), 1990 (1R03) &1994(1R05)	VT-3	VT-3 examination of H-8 and H-9 welds from annulus. No indications identified.
	1998 (1R07)	VT-3	50% of shroud legs @ 10°, 30°, 60° Azimuths and 50% of annulus floor. No indications identified.
	2000 (1R08)	EVT-1	Visual examination of H-8 and H-9

			welds from annulus at 0 and 180 Degree azimuths. No indications identified.
	2004 (1R10)	EVT-1 & UT	Visually examined H-8 from annulus at 0° and 180° and UT examined 10% of H9. One indication was identified by UT on H9 that was acceptable to the requirements of IWB-3000.
Core Spray Piping	1987 (1R01) to 1996 (1R06)	VT-1	Enhanced VT-1 (1 mil resolution) examination performed every refueling outage on piping and welds per IEB 80-13. No indications identified.
	1998 (1R07)	UT & CSVT-1	UT baseline and visual of piping. No indications identified.
	2002 (1R09)	UT	UT all creviced welds plus 25% sample of P4(c) welds. One indication was identified on P3bA (~ 3.1 inches). No other indications were identified.
		EVT-1	EVT-1 of un-demonstrated welds P4dB, P4dC, P4dD, P8aA, P8aB, P8aC, and P8aD. No indications identified.
	2004 (1R10)	EVT-1	EVT-1 of previous P3bA indication. No change in identified length. EVT-1 of un-demonstrated welds P4dA, P8aA, P8aB, P8aC, and P8aD. No indications identified.
	2006 (1R11)	UT & EVT-1	UT of previous P3bA indication (~ 2.8 inches – no change) and most other creviced welds. UT equipment issues on 13 of 24 welds and alternatively EVT-1 examined. No new indications identified.
		EVT-1	EVT-1 of un-demonstrated welds P4dB, P8aA, P8aB, P8aC, and P8aD. Two indications were identified on P8aC as weld discontinuities that were likely opened up from construction. No other

			indications were identified.
	2008 (1R12)	EVT-1	EVT-1 of previous P3bA indication. No change in identified length. EVT-1 of un-demonstrated welds P4dC, P8aA, P8aB, P8aC, and P8aD. No change in previous discontinuities. No new indications identified. Due to UT failure in 2006, the following 13 welds were visually inspected in 2008 - P3aB, P3bB, P4aB, P4aC, P4aD, P5B, P6B, P6D, P7B, P8bA, P8bB, P8bC, and P8bD. These welds are expected to return to a UT reinspection frequency of 2R after the next UT in 2010. No indications identified.
Core Spray Piping Brackets	1987 (1R01) to 1996 (1R06)	VT-1	VT-1 examination performed every refueling outage on piping and welds per IEB 80-13. No indications identified.
	1998 (1R07)	CSVT-1	Examined all eight brackets (PB1 through PB8). No indications identified.
	2000 (1R08)	EVT-1	Examined brackets PB1 and PB2. No indications identified.
	2002 (1R09)	EVT-1	Examined brackets PB3 and PB4. No indications identified.
	2004 (1R10)	EVT-1	Examined brackets PB5 and PB6. No indications identified.
	2006 (1R11)	EVT-1	Examined brackets PB7 and PB8. PB7 was identified with indications on the two upper bolts. In each case, one of two tack welds was found to be cracked. No other indications identified.
	2008 (1R12)	EVT-1	Examined brackets PB1 and PB2. No indications identified. PB7 indication was re-inspected with no change in

			condition noted.
Core Spray Sparger	1987 (1R01) to 1996 (1R06)	VT-1	Enhanced VT-1 (1 mil resolution) examination performed every refueling outage on piping and welds per IEB 80-13. No indications identified.
	1998 (1R07)	EVT-1 & CSVT-1	EVT-1/CSVT-1 all spargers. No indications identified.
	2000 (1R08)	EVT-1	EVT-1 examined welds S1A, S1B, S2aA, S2aB, S2bA, S2bB, S4aA, S4aB, S4bA, and S4bB. No indications identified.
		VT-1	VT-1 examined welds S3aXXA, S3bXXA, and S3dXXA on nozzles 1A through 65A. No indications identified.
	2002 (1R09)	EVT-1	EVT-1 examined welds S1C, S1D, S2aC, S2aD, S2bC, S2bD, S4aC, S4aD, S4bC, and S4bD. No indications identified.
		VT-1	VT-1 examined welds S3aXXB, S3bXXB, and S3dXXB on nozzles 1B through 65B. VT-1 examined welds S3c4B, S3d4B, S3c62B, and S3d62B. No indications identified.
	2004 (1R10)	EVT-1	EVT-1 examined welds S1A, S1B, S2aA, S2aB, S2aD, S2bA, S2bB, S4aA, S4aB, S4bA, and S4bB. No indications identified.
		VT-1	VT-1 examined welds S3aXXC, S3bXXC, and S3dXXC on nozzles 1C through 65C. No indications identified.
	2006 (1R11)	EVT-1	EVT-1 examined welds S1C, S1D, S2aC, S2aD, S2bC, S2bD, S4aC, S4aD, S4bC, and S4bD. No indications identified.
		VT-1	VT-1 examined welds S3aXXD, S3bXXD, and S3dXXD on nozzles 1D through 65D. VT-1 examined welds

			S3c4D, S3d4D, S3c62D, and S3d62D. No indications identified.
	2008 (1R12)	EVT-1	EVT-1 examined welds S1A, S1B, S2aA, S2aB, S2bA, S2bB, S4aA, S4aB, S4bA, and S4bB. No indications identified.
		VT-1	VT-1 examined welds S3aXXA, S3bXXA, and S3dXXA on nozzles 1A through 65A. Re-examined welds S3aXXD, S3bXXD, and S3dXXD on nozzles 1D through 65D due to camera quality issues from 2006. No indications identified.
Core Spray Sparger Brackets	1987 (1R01) to 1996 (1R06)	VT-1	VT-1 examination performed every refueling outage on piping and welds per IEB 80-13. No indications identified.
	1998 (1R07)	CSVT-1	Examined all brackets (SB01 through SB12). No indications identified.
	2000 (1R08)	VT-1	Examined brackets SB01, SB02, SB03, SB10, SB11 and SB12. No indications identified.
	2002 (1R09)	VT-1	Examined brackets SB04, SB05, SB06, SB07, SB08, and SB09. No indications identified.
	2004 (1R10)	VT-1	Examined brackets SB01, SB02, SB03, SB10, SB11, and SB12. The middle bracket on SB11 was found slightly deformed. No other indications identified.
	2006 (1R11)	VT-1	Examined brackets SB04, SB05, SB06, SB07, SB08, and SB09. SB08 was found slightly deformed, no other indications identified.
	2008 (1R12)	VT-1	Examined brackets SB01, SB02, SB03, SB08, SB10, SB11, SB12.

			Discrepancies on SB08 and SB11 were re-examined with no change in condition.
Top Guide (Rim, etc.)	1987 (1R01)	VT-3	VT-3 examination of accessible welds and surfaces. No indications identified.
	1990 (1R03)	VT-3	VT-3 examination of accessible welds and surfaces. Also, VT-3 examination of 32 wedges, bolts, and keepers. No indications identified.
	1994 (1R05)	VT-1 & VT-3	VT-1 examination of accessible welds and surfaces at core locations 14-31, 22-23, 22-39, 30-15, 30-47, 38-23, 38-39, and 46-31. Also, VT-3 examinations of 32 wedges, bolts, and keepers. No indications identified
	1998 (1R07)	VT-1 & VT-3	VT-1 of grids 30-31 and 34-35. Also, VT-3 surfaces and welds (0°-180°) including wedges, bolts and keepers. No indications identified.
	2000 (1R08)	VT-3	C-Clamps at 0°, 90°, 180° and 270°. No indications identified.
	2004 (1R10)	VT-3	C-Clamps at 0°, 90°, 180° and 270°. No indications identified.
Core Plate (Rim, etc.)	1998 (1R07)	VT-3	VT-3 welds and surfaces, including 17 hold down bolts/nuts and 7 fuel support castings. No indications identified.
SLC			N/A, SLC connects to Core Spray System.
Jet Pump Assembly	1987 (1R01), 1990 (1R03), &1994(1R05)	VT-3	VT-3 examination of all jet pump components No indications identified.
	1998 (1R07)	MVT-1	Examined all RB-1, RB-2, RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, WD-1, DF-1, DF-2, AD-1 and

			AD-2 welds on JP 1 through JP 10. Also, JP19/20 RS-3 weld was examined. No indications identified.
	2000 (1R08)	EVT-1	EVT-1 examined RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, DF-1, DF-2, AD-1 and AD-2 welds, as well as all RB-1 welds and RB-2c on JP 11 and JP 12. EVT-1 examined RS-1, RS-2, RS-3, RS-6, RS-7, IN-4, MX-2, DF-1, DF-2, AD-1 and AD-2 welds on JP 13 and JP14. EVT-1 examined RS-1, RS-2, RS-3, RS-6, RS-7, RS-8, and RS-9, as well as RB-1a, b, d and all RB-2 welds on JP 15 and JP 16. Also, examined IN-4, MX-2, DF-1, DF-2, AD-1 and AD-2 welds on JP 15. No indications identified.
		VT-1	VT-1 examined WD-1 for JP11, JP12, JP13, JP14 and JP15. No indications identified.
	2002 (1R09)	EVT-1	EVT-1 examined all RB-1 and RB-2 welds on JP13/14 riser. EVT-1 examined RB-2a, RB-2b, and RB-2d welds on JP11/12 riser. EVT-1 examined IN-4, MX-2, DF-1, DF-2, AD-1 and AD-2 welds on JP16, and the RB-1c weld on JP15/16 riser. EVT-1 examined RS-3 weld on JP17/18 riser. EVT-1 examined RS-8 and RS-9 on all ten risers due to scope expansion from an indication identified on JP13/14 RS-9 weld (~0.38 inches). No other indications identified.

		VT-1	VT-1 examined WD-1 for JP1, JP2, JP13, and JP14. No indications identified.
	2004 (1R10)	EVT-1	EVT-1 examined RS-3, RS-6, and RS-7 welds on JP 1, JP 2, JP3, JP 4, JP 7, JP 8, JP 9, and JP 10. EVT-1 examined RS-3 weld on JP19/20 riser. EVT-1 examined RS-1, RS-2, RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, DF-1, DF-2, AD-1 and AD-2 welds, as well as all RB-1 and RB-2 welds on JP 17 and JP 18. Re-examined previous indication JP13/14 RS-9 by EVT-1. No change in flaw length. No other indications were identified.
		VT-1	VT-1 examined WD-1 on JP16, JP17, and JP18. Initially, suspected wedge movement on JP18 prompted an investigation into the condition of the setscrews. Both tack welds on the shroud side set screw were cracked on JP18. The setscrew was staked and an auxiliary wedge installed. No other indications were identified.
	2006 (1R11)	EVT-1	EVT-1 examined RS-1 and RS-2 welds on risers of JP3/4, JP5/6, JP7/8, JP9/10, and JP19/20. EVT-1 examined RS-3 weld on JP11/12, JP13/14 and JP15/16 risers. EVT-1 examined all RB-1 welds on JP7/8, JP9/10, and JP11/12 risers. EVT-1 examined all RB-2 welds on JP1/2, JP7/8, and JP9/10 risers. EVT-1 examined RS-6 and RS-7 welds

			on JP5/6, JP13/14, and JP15/16 risers. EVT-1 examined IN-4 weld on JP 11, and JP 16. EVT-1 examined IN-4, MX-2, DF-2, and AD-1 welds on JP 9. EVT-1 examined DF-2 on JP 10. EVT-1 examined DF-2, AD-1, and AD-2 welds on JP 6 and JP 7. EVT-1 examined previous indication at JP13/14 RS-9. No change in flaw length. No other indications were identified.
		VT-1	VT-1 examined all twenty WD-1, AS-1 and AS-2 locations in response to wear identified on Li2R08 during 2005. Gaps were identified on vessel side setscrews of JP4, JP7, JP9, JP13, JP15, JP19, and JP20. Cracked tack welds were identified on shroud side setscrews of JP8, JP12, JP14, JP17, JP18, and JP19. Slip Joint Clamps were proactively installed on all twenty Jet Pumps. Five auxiliary wedges installed: two at JP13 (pre-emptive due to RS-9 flaw), two at JP14 (pre-emptive due to RS-9 flaw), and one at JP15 (vessel side only due to 23 mil gap). No other indications identified. Visually examined auxiliary wedge previously installed at JP18 shroud side setscrew. No indications identified.
	2008 (1R12)	EVT-1	EVT-1 examined RS-3, RS-7, R-8, and RS-9 weld on JP17/18 riser. No indications identified. EVT-1 examined IN-4, MX-2, DF-1, DF-2, AD-1, AD-2, RS-3, RS-6, RS-7, RS-8, and RS-9 welds, as well as all RB-

			1 and RB-2 welds on JP 19 and JP 20. No indications identified. EVT-1 examined previous indication at JP13/14 RS-9. No change in flaw length. No other indications were identified.
		VT-1	VT-1 examined all twenty main wedges (WD-1). Minor wedge wear was identified on JP 18, JP 19, and JP 20. WD-2a, WD-2b, MX-7, welds were also examined on JP 18, JP 19, and JP 20 as part of the expanded scope required from identifying main wedge wear. Minor wedge rod wear was identified on JP 4, JP 18, JP 19, and JP 20. Since slip joint clamps (installed in 2006) mitigate slip joint bypass leakage vibrations, this main wedge damage and rod wear was determined to be caused by turbulent flow. Two auxiliary wedges were installed around both the shroud and vessel side set screws on JP 19 and JP 20. JP 18 has one previously installed auxiliary wedge around the shroud side set screw. The main wedge wear and rod wear were found to be acceptable for continued service without repair. Set screw gaps (AS-1) and tack welds (AS-2) were inspected at all locations not blocked by an auxiliary wedge. Gaps were identified on vessel side setscrews of JP 2 (20 mils), JP 3 (5 mils), JP 9 (14 mils), and JP 20 (8 mils). One auxiliary wedge was installed to repair the gap on the vessel side set screw of JP 2. The remaining gaps were evaluated as acceptable without repair. Previously identified gaps at JP 4, JP 7, and JP 19 are no longer visible. Cracked tack welds were re-inspected on the shroud side setscrews of JP 8, JP 12, JP 14, JP 17, and JP 19 with no change in condition noted.

			All 20 Slip Joint Clamps were examined after one cycle of operation. No indications were identified.
		VT-3	Five auxiliary wedges were inspected after one cycle of operation: two at JP13, two at JP14, and one at JP15 (vessel side). No indications were identified.
Jet Pump Beams	1994 (1R05)	UT	UT baseline of replacement hold-down beams. No indications identified.
	2004 (1R10)	UT	UT examined BB-1, BB-2, and BB-3 of all 20 jet pump hold down beams. One indication identified in BB-2 region of JP 4. This beam was changed out during the same refuel outage with a Group 3 style beam. No other indications identified.
	2006 (1R11)	VT-3	VT-3 examined BB-1, BB-2, and BB-3 on replacement beam for JP 4. No indications identified.
	2008 (1R12)	UT & EVT-1	UT examined BB-1, BB-2, and BB-3 of all jet pump hold down beams with the exception of JP 4 (Group 3) beam that was installed in 2004. One indication was identified in the BB-3 region of JP 1 beam. A supplemental visual exam (EVT-1) was performed and surface discontinuities were noted that could explain the UT indication. The UT indication was determined to be non-relevant and the beam was not replaced. One indication was identified in the BB-2 region of the JP 8 beam. A supplemental visual exam (EVT-1) could not confirm the presence of any surface discontinuities that would explain the

			indication, therefore, this beam was replaced during the same refuel outage with a Group 3 style beam.
Jet Pump Diffuser			See Jet Pump Assembly
CRD Guide Tube	1990 (1R03)	VT-3	VT-3 examination of replacement CRDs at core locations 10-23, 14-19, 14-23, 14-31, 18-43, 18-55, 22-11, 22-39, 22-47, 26-03, 26-11, 26-27, 30-23, 30-3530-55, 34-23, 34-37, 34-31, 34-39, 38-07, 38-23, 38-31, 38-35, 38-39, 42-19, 46-11, 46-39, and 54-31. No indications identified.
	1992 (1R04)	VT-3	VT-3 examination of control rod assembly at core locations 30-11,22-55, 54-23, 38-07, 38-55, and 22-07. No indications identified.
	1994 (1R05)	VT-3	VT-3 examination of replacement CRDs at core locations 02-43, 10-19, 10-39, 14-39, 18-23, 18-39, 20-35, 26-27, 26-31, 30-47, 34-31, 34-47, 38-19, 38-35, 38-41, 42-15, 42-55, 50-43, 54-19, and 58-31. No indications identified.
	1998 (1R07)	VT-3	VT-3 of CRDs at core loc. 54-49, 48-55,50-51, 42-59, 30-31, 30-34, 34-35, 26-31, 34-31, 26-27, 30-27, and 34-27. No indications identified.
	2000 (1R08)	EVT-1 & VT-3	Examined CRGT-1,2,3 and FS/GT-ARPIN-1 at core locations 30-55, 38-31 and 38-39. No indications identified.
	2004 (1R10)	EVT-1 & VT-3	Examined CRGT-1,2,3 and FS/GT-ARPIN-1 at 10-39, 18-27, 18-35, 26-43, 30-15, 30-47, 34-15, 34-19, 34-43, and 46-11. No indications identified.
	2008 (1R12)	EVT-1 & VT-3	Examined CRGT-2 and CRGT-3 at 14-15, 14-51, 18-43, 18-55, 30-31, 34-35,

			38-19, 42-23, and 42-27. The integrity of the CRGT-1 and FS/GT-ARPIN-1 at each core location identified above was verified via the cell disassembly / reassembly procedure (M-C-741-301) as allowed by BWRVIP-47-A. No indications identified.
CRD Stub Tube	1992 (1R04)	VT-2	VT-2 examination from vessel exterior on 100% of penetrations once per interval, in excess of Section XI. No indications identified.
	1996 (1R06)	VT-2	VT-2 examination from vessel exterior on 100% of penetrations. No indications identified.
	1998 (1R07)	VT-3	VT-3 of tube to housing and tube to RPV weld at core loc. 54-49, 48-55,50-51, 42-59, 30-31, 30-34, 34-35, 26-31, 34-31, 26-27, 30-27, and 34-27. No indications identified.
	2000 (1R08)	VT-2	VT-2 examination from vessel exterior on 100% of penetrations. No indications identified.
	2006 (1R11)	VT-2	VT-2 examination from vessel exterior on 100% of penetrations. No indications identified.
In-Core Housing	1992 (1R04)	VT-2	VT-2 examination from vessel exterior on 100% of penetrations once per interval, in excess of Section XI. No indications identified.
	1996 (1R06)	VT-2	VT-2 examination from vessel exterior on 100% of penetrations. No indications identified.
	1998 (1R07)	VT-3	VT-3 of housing and weld to RPV at core loc. 48-53, 32-29, 24-29, 24-33, and 32-33. No indications identified.

	2006 (1R11)	VT-2	VT-2 examination from vessel exterior on 100% of penetrations. No indications identified.
Dry Tube	1989 (1R02)	VT-3	VT-3 examination of accessible portions of dry tubes at core locations 16-45, 40-45, 40-21, 16-21, (SRM's), 16-53, 48-53, 24-37, 32-37, 32-29, 24-29, 48-13, and 16-13 (IRM's). No indications identified.
	1992 (1R04)	VT-1	VT-1 examination of 4 dry tubes. No indications identified.
	1994 (1R05)	VT-1	VT-1 examination of dry tubes at core locations: 24-37 (IRM), and 40-21 and 38-23 (SRM). No indications identified.
	2004 (1R10)	VT-1	Examined SRMs at 16-45 and 40-21 and IRMs at 24-29, 24-37, 32-37 and 48-13. Dry tube 24-29 identified as not fully engaged with the top guide. No other indications identified.
	2006 (1R11)	N/A	Replaced dry tubes SRMs 16-21 and 40-45 and IRMs 24-29, 24-37, 48-13, and 48-53 with new universal style dry tube and shuttle tube.
	2008 (1R12)	N/A	Replaced dry tubes SRMs 16-45 and 40-21 and IRMs 16-13, 16-53, 32-29, and 32-37 with new universal style dry tube and shuttle tube.
Instrument Penetrations	1990 (1R03)	VT-3	VT-3 examination of interior attachment of instrument nozzles N16A through D, N12A through D, and N11 A & B. No indications identified. PT examination performed on all instrument nozzle to safe end welds once per interval, per Section XI (includes N10 Core Differential Pressure penetration). No indications identified.

	1996 (1R06)	VT-2	VT-2 examination from vessel exterior on 100% of penetrations once per interval, in excess of Section XI. No indications identified.
	2006 (1R11)	VT-2	VT-2 examination from vessel exterior once per interval. No indications identified.
Vessel ID Attachment Welds	1987 (1R01) to 1996 (1R06)	VT-1 & VT-3	VT-1 or VT-3 performed on all ID attachment welds once per interval per Section XI. No indications identified.
	1998 (1R07)	MVT-1/CSVT-1	Examinations include 4 steam dryer support brackets, 5 jet pump riser brace support pads on JP 1 through 10, and 8 core spray support bracket welds. No indications identified.
		VT-1	VT-1 examined 2 surveillance sample holder attachment welds (30 deg and 120 deg). No indications identified.
		VT-3	VT-3 examined one Guide Rod bracket attachment weld at 0 degrees. No indications identified.
	2000 (1R08)	EVT-1	EVT-1 examination of two Core Spray Piping Brackets at 15 degrees and 85.5 degrees. No indications identified.
		VT-3	VT-3 examined one Guide Rod bracket attachment weld at 180 degrees. No indications identified.
	2002 (1R09)	EVT-1	EVT-1 examination of Jet Pump Riser Brace Support Pads on JP15/16 and JP17/18, Feedwater Sparger End Brackets at 5°, 55°, 65° and 115°, and Steam Dryer support lugs at 4° and 94°, and Core Spray Brackets at 112.5° and 165°. No indications identified.
	2004 (1R10)	EVT-1	

	2006 (1R11)	EVT-1	EVT-1 examination of Jet Pump Riser Brace Support Pads on JP1/2, JP3/4, JP7/8 and JP19/20, Feedwater Sparger End Brackets at 125°, 175°, 185° and 235°, Steam Dryer support lug at 184°, and Core Spray Brackets at 195° and 247.5°. No indications identified. EVT-1 examination of Jet Pump Riser Brace Support Pads on JP5/6, JP9/10, JP11/12 and JP13/14, Feedwater Sparger End Brackets at 245°, 295°, 305° and 355 °, Steam Dryer support lug at 274°, and Core Spray Brackets at 274.5° and 345°. No indications identified.
		VT-1	VT-1 examined attachment welds of one surveillance sample holder at 300°. No indications identified.
		VT-3	VT-3 examined both Guide Rod lugs at 0° and 180°. No indications identified.
	2008 (1R12)	EVT-1	EVT-1 examination of Jet Pump Riser Brace Support Pads (RBSP) on JP1/2 and JP19/20, Feedwater Sparger End Brackets (FWSB) at 5°, 55°, and 65°, and Core Spray Brackets (CSB) at 15° and 85.5°. No indications identified. EVT-1 examined the Steam Dryer support bracket attachment weld at 4° and identified a minor wear mark on the top surface of the bracket itself. When compared to previous inspection video, there was no change in condition. The attachment weld had no indications identified.
LPCI Coupling	1987 (1R01), 1990 (1R03), &1994(1R05)	VT-3	VT-3 examination of all 4 couplings. No indications identified.
	1998 (1R07)	MVT-1	All of N-17A and B. No indications

			identified.
	2000 (1R08)	EVT-1, VT-1, & VT-3	All of N-17C and D. No indications identified.
	2002 (1R09)	EVT-1 & VT-3	N17A, locations 45-3b, 6a, 6b, 6c and 6d. No indications identified.
	2004 (1R10)	EVT-1, VT-1, & VT-3	N17A, locations 45-8a, 8b, 8c, 8d and 12 and all of N17B. No indications identified.
	2008 (1R12)	EVT-1, VT-1, & VT-3	All of N17C and N17D were examined. No indications identified. Due to new angle and distance requirements for visual exams in accordance with BWRVIP-03 Revision 10, the 45-12 (Sleeve Flange to Thermal Sleeve) welds on both LPCI couplings were performed as best effort EVT-1 exams.
Steam Dryer	1998 (1R07)	VT-1 & VT-3	VT-1 examined the steam dryer drain channel welds. No indications identified. VT-3 examined the overall condition of the steam dryer. No indications identified.
	2000 (1R08)	VT-1	VT-1 examined the steam dryer drain channel welds. No indications identified.
	2002 (1R09)	VT-1 & VT-3	VT-1 examined the steam dryer drain channel welds. Stain identified on drain channel SDDC4c. No other indications identified. VT-3 examined the overall condition of the steam dryer. No indications identified.
	2004 (1R10)	VT-1 & VT-3	VT-1 examined cover plate welds, outer bank hood seam welds, drain channel

			welds, and previous support ring indications. One support ring bolt was found with old mechanical deformation/damage and left as-is. Minor IGSCC previously identified on the support ring. No other indications identified. VT-3 examined steam dryer tie bars. During examination of tie bars, one cam nut was found to be protruding from end bank number 6. This cam nut was staked during the same outage.
	2006 (1R11)	VT-1	Performed BWRVIP-139 inspections of cover plates SDCP 1a-b and 7a-b, top and bottom hood SDBH 1a-b, 2a-b, 3a-b, 4a-b, 5a-b, and 6a-b, end bank welds SDEB 1a-d and 2a-d, lifting lugs, support ring and cam nut tack welds. Minor IGSCC identified on the support ring and tack weld cracking on cam nuts. No other indications identified.
	2008 (1R12)	VT-1	VT-1 examined cover plates (SDCP1a-b, SDCP7a-b), hood seam welds (SDHS1a-d, SDHS2a-e, SDHS3a-e, SDHS4a-e, SDHS5a-e, SDHS6a-d), lifting rod eye welds (SDLRALE, SDLRBLE, SDLRCLE, SDLRDLE), plenum partitions (SDPP2a-b, SDPP3a-b, SDPP4a-b, SDPP5a-b), and all 37 tie bars (SDTB01-SDTB37). Minor IGSCC indication re-examined on support ring in area of SDCP7b. No change in condition. IGSCC indication identified on SDHS4d at the top of the hood seam weld. Indication is approximately 1.5 inches in length and was evaluated as acceptable. No repair required. Indications identified on 11 cam nuts

			(SDCN). All were evaluated as acceptable. No repairs required.
Access Hole Covers	1987 (1R01), 1990 (1R03), &1994(1R05)	VT-3	VT-3 examination of both access hole covers and welds at 0° and 180°. No indications identified.
	1998 (1R07)	VT-3	VT-3 examination of both access hole covers and welds at 0° and 180°. No indications identified.
	2004 (1R10)	EVT-1, VT-1	EVT-1 and VT-1 examination of both access hole cover welds at 0° and 180°. No indications identified.
	2008 (1R12)	VT-1	VT-1 examined all access hole cover welds at 0° and 180°. No indications identified.
DM Welds-BWRVIP-75-A Category A	2008 (1R12)	UT	1 weld inspected: 1 automated, no flaws, no repairs
DM Welds-BWRVIP-75-A Category C	2006 (1R11)	UT	3 welds inspected: 1 weld with 82/182, 3 manual, no flaws, no repairs
	2008 (1R12)	UT	5 welds inspected: 5 weld with 82/182, 1 manual, 4 automated, no flaws, no repairs

Reactor Internals Inspection History

Plant: **Nine Mile Point 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	RF11 (3/08)	UT	Reinspection (2008): Two sided UT coverage on H1 thru H8. No significant crack growth in depth at previously cracked weld H4,H5 and H7 (industry weld H6B). New indications primarily in previously un-inspected regions. Previous far side detection only location, H2 ring side, has indications in locations previously considered not cracked based on far sided H2 ring coverage. Coverage achieved equal to or better than original 1998 baseline. Inspection results remain bounded by existing shroud analysis for at least 1 cycle, update mutli-cycle analysis in progress based crediting BWRVIP-62 HWC/NMCA for welds H4, H5 and H7.
	RF11 (3/08)	EVT-1	Scheduled UT tool could not be deployed. Performed supplemental single sided visual (EVT-1) examination to confirm no cracking at intersection of horizontal welds, no indications noted. Operation for one cycle based on screening of horizontal welds justified. NMP2 is a cat c shroud. NMP2 to complete BWRVIP-76 vertical weld inspections as required based on shroud multi-cycle horizontal weld analysis results in RF12.
	RF10 (3/06)		No inspections required
	RF09 (3/04)	UT	Re-examination of H4, H5 with no significant growth noted. Completed two sided coverage of H6A & H6B (phased array on ring side of H6B) no flaws noted in ring and no growth noted

			on lower side of H6B.
	RF08 (3/02)	EVT-1	Visual exam of V24 & V25 OD only, no indications noted
	RF07 (3/00)	UT	RF07 (3/00) Performed UT exams of H4 & H5 only. Crack growth was within established limits.
	RF06 (5-98)	UT	RF06 (5-98) - Base line UT exams performed. Welds H1 through H7 inspected with indications observed in all but weld H6. Indications varied from approximately 2% to 85% of length inspected with maximum depth of 0.65 inches. All indications acceptable for continued operation. Welds V12 through V17 inspected with no indications observed.
	RF03 (10/93)	VT	H1, H2, H7 OD H3, H4, H5 ID No reportable indications
Shroud Support	RF11 (3/08)	EVT-1	Access Hole Covers at 0 degree No indications found.
		EVT-1	Shroud to baffle plate between JP20-JP1 No indications found.
	Mid-Cycle (11/07)	VT-1	Disassembly of JP11 provided access to H-10, H-11 and H-12 welds of the shroud support legs at 190 and 210 degrees. Approximately 20% coverage was obtained with VT-1 resolution. No indications found
	Mid-Cycle (11/07)	VT-1	Disassembly of JP11 provided access to the bottom side of H9A (H8) and H9B (H9) welds at 202 degrees. Approximately 5.5% coverage was obtained with VT-1 resolution. No indications found
	RF10 (3/06)	EVT-1	H9 weld inspections performed between

			JP sets and one Access Hole cover plate examined (top hat design). No indications found.
	RF09 (3/04)	UT	Obtained 100% coverage of H9 from vessel side, a single ½" long original construction flaw was noted (not surface connected)
	RF08 (3/03)	EVT-1	Both access hole covers examined, no indications noted. (SIL 462, rev 1 exam)
	RF07	EVT-1	~25% of H9A & H9B
	RF06 (5-98)		RF06 (5-98) - No Inspections Performed
	RF04 (5/95)	VT-3	The shroud support access hole cover welds were found to be free of radial cracking.
Core Spray Piping	RF11 (3/08)	EVT-1	P2 piping T-Box cover plate welds at 120 and 240 degrees. No indications found.
		EVT-1	P3 piping to T-Box welds at 120 and 240 degrees. No indications found.
		EVT-1	P4c downcomer to elbow welds and P4d elbow to pipe welds at 170 and 350 degrees. No indications found.
		EVT-1	P5, P6 and P7 welds on all four downcomers at 10, 170, 190, and 350 degrees. No indications found.
		EVT-1	P8a pipe to thermal sleeve weld and P8b thermal sleeve to Shroud weld on all four downcomers at 10, 170, 190 and 350 degrees. No indications found.
	RF10 (3/06)	EVT-1	Visual pick-up exams on 4 remaining target welds, P8a & P8b that were not UT examined last outage. No

			indications found.
	RF09 (3/04)	UT / EVT-1	Baseline UT, including both P1 welds, completed with no indications noted. Also other BWRVIP visual exams completed
	RF08 (3/02)	EVT-1	Inspections performed per BWRVIP guidelines. No indications found.
	RF07 (3/00)	VT	RF07 (3/00) – Per BWRVIP-guidelines, 100% of target welds and 25% of remaining welds. No indications found
	RF06, 1998	EVT-1	RF06 (5-98) - No Indications EVT-1 only
	RF01 (10/90)	VT	No indications
	RF02 (3/92)		
	RF04 (5/9)		
Core Spray Sparger	RF11 (3/08)	EVT-1	S1 cover plate to T-Box welds at 10, 170, 190 and 350 degrees. No indications found.
		EVT-1	S2 T-Box to sparger pipe welds at 10, 170, 190 and 350 degrees. No indications found.
		VT-1	S3a and S3b welds on the A and B Sparger nozzles. No indications found.
		VT-1	B and D Sparger drain welds at 260 and 280 degrees. No indications found.
		EVT-1	S4 end cap to Sparger pipe welds at 85, 95, 265 and 275 degrees. No indications found.
		VT-1	Sparger Bracket to Shroud welds at 10, 40, 45, 50, 80, 280, 310, 315, 320 and 350 degrees. No indications found.
	RF10 (3/06)	EVT-1 /	Inspections performed per BWRVIP

		VT-1	guidelines. No indications found.
	RF09 (3/04)	EVT-1 / VT-1	Inspections performed per BWRVIP guidelines. No indications found.
	RF08 (3/02)	EVT-1 / VT-1	Inspections performed per BWRVIP guidelines. No indications found.
	RF07 (3/00)	VT	RF07 (3/00) Per BWRVIP guidelines - 1 sparger (welds S3a, S3b,S3c & brackets) No indications found
	RF06 (5-98)	VT	RF06 (5-98) - No Indications EVT-1 & MVT
	RF04 (5/95)		
	RF02 (3/92)	VT	No indications
	RF01 (10/90)		
Top Guide (Grid Beam, etc.)	RF11 (3/08)	EVT-1	Examined one cell (Lower 25% of the vertical plate, bottom of plate and grid intersections) No indications found
	RF10 (3/06)		No inspections performed
	RF09 (3/04)	VT-3	No Inspections required
	RF08 (3/02)	VT	Completed inspections of 3 holddown clamps. No indications found. (1 restricted coverage of 50% due to fuel)
	RF07 (3/00)	VT-3	Limited inspection on the 4 "C-clamps" Limited due to fuel cells not removed. Scheduled for RF08 to meet BWRVIP requirements
	RF06, 1998	VT-3	
	RF04 (5/95)		
	RF02 (3/92)		
	RF01 (10/90)		No indications

Core Plate (Rim hold down bolts, etc.)	RF11 (3/08)		No inspections performed
	RF10 (3/06)		No inspections performed.
	RF09 (3/04)		No Inspections Required
	RF08 (3/02)		Performed engineering evaluation to justify no inspections required in RF08
	RF07 (3/00)		No inspections performed
			Examine Bolt Locking Device per SIL 588R1
	RF06 (5-98)	VT-3	No Indications Core plate bolting & Core plate
SLC	RF11 (3/08)		No inspections required
	RF10 (3/06)		No inspections required
	RF09 (3/04)		N/A, NMP2 (injects boron through HPCS line)
	RF08 (3/02)	UT	UT of N11 safe-end to nozzle weld and accessible portions of adjacent base metal using PDI qualified technique. No indications found.
	RF07 (3/00)		No Inspections performed
	RF06 (5-98)		2RPV-KB34 provides core ΔP only Nozzle exams per ASME code No Inspections
	RF04 (5/95)	PT	Core plate ΔP only this unit 2RPV-KB34 No reportable indications
Jet Pump Assembly	RF11 (3/08)	EVT-1	Examined IN-1 & IN-2 welds for Jets Pumps 1-10. No indications found
		VT-1/VT-3	Examined clamp assemblies on jet Pumps 1-12, 13-18 and 20
		EVT-1	Vibration instrumentation at 30 and 90

			degrees.
		VT-1	Sensing lines and stand-offs for Jet Pumps 1-10, 16 and 17 - Circumferential indication was found on the bottom side of the lower stand-off. Use-As-Is Disposition
		VT-1	Wedges (WD1) and Wedge Rods (2A/B) for Jet Pumps 2 and 9-17 - No change in previously reported rod wear on JP2 - No change in previously reported wedge movement and rod wear on JP09. - No change in previously reported wedge movement and rod wear on JP10. - No change in previously reported wedge movement and rod wear on JP11. - No change in previously reported wedge movement and rod wear on JP12. - No change in previously reported wedge movement on JP13. - No change in previously reported wedge movement on JP15. - No change in previously reported wedge movement and rod wear on JP17.
		EVT-1	Jet Pump Beams (BB1 & BB3) on pumps 8-11, 16 and 20 - JP10 was found with an indication in the BB3 area. Use-As-Is Disposition
		EVT-1	Riser welds RS6 & RS7 on the 30, 60, 120, 150, 240 and 270 degree risers.
		EVT-1	Riser welds RS 8 & RS9 on the 30, 60, 90, 120, 150, 210, 240, 270, 300 and 330 degree risers - Indication was found adjacent to the RS9 weld on JP14 side of the 240 degree riser. Use-As-Is Disposition - Indication was found adjacent to the RS9 weld on JP16 side of the 270 degree riser. Use-As-Is Disposition
		EVT-1	Riser Brace Yoke to riser welds (2a,b,c

			and d) on the 30, 60, 120, 150, 240 and 270 degree risers
		EVT-1	Riser Brace Leaf to pad welds (1a,b,c and d) on the 30, 60, 120, 150, 240 and 270 degree risers
		VT1/VT3	Aux. wedges on Jet Pumps 11, 16 and 20
		VT-1	Set Screw gaps on Jet Pumps 11, 13-16 and 20 - Gap was found on the vessel side of JP13. Aux. wedge installed
		EVT-1	Riser weld RS1 on the 120, 240 and 270 degree risers - Indication was found adjacent to RS1 weld on the vessel side. Use-As-Is Disposition
		EVT-1	Riser weld RS2 on the 240 and 270 degree risers
		VT-3	Riser Brace assembly on the 240 and 270 degree risers
	RF10 (3/06)		Examined all previously installed repair clamps & wedges a. Pre-emptive repair, clamps installed, on the remaining 13 JP's due to increase in core differential pressure in Cycle 10 (20 JP's now have clamps) b. UT JP beams, replaced two that had flaw like indications
	RF09 (3/04)	UT / EVT-1 VT-1	UT of 2 risers with no indications noted. Have completed 50% of inspections per BWRVIP guidelines. a. Performed re-inspection of main wedges and set screws for gaps (all) b. Identify locations where gaps/ wedge wear was noted during RF09,

			which required aux. wedge/ clamp installation c. Pre-emptive repair (i.e., clamp / wedge installation) performed. Installed clamps on JP's 5, 6, 13, 15, 16, 19 and 20. Installed auxiliary wedges on JP's 1, 7, 16, 19 and 20
Jet Pumps 5,6,15,16	RF08 (3/02)	EVT-1 VT-1	Baseline inspection of 5 JP's performed. Expanded sample of all to determine restrainer bracket wedge wear and / or set screw gaps. Installed 2 aux. wedges, (JP 6 & 11) to address gaps. 3 additional set screw gaps identified (JP 7,16,20 gaps within engineering allowable) No other indications were noted.
		VT	RF07 JP 5 & 6 reinspected wedges for previously identified movement, no major change noted
Jet Pumps 1 thru 10	RF06	EVT-1 VT-1	No Indications Welds RS-1, RS-2 & RS-3 Riser welds RB-1, RB-2, RB-8 & RB-9
Jet Pumps 5, 6, 11, 12, 19, 20	RF06 (5-98) Expanded Scope	VT-1	Beam engagement, Rams head seating, Set screw gap & tack welds, and wedge assembly
	RF05 (11/95)		Adjusting screws gap RF04-RF05
	RF04 (5/95)		Replaced Beams RF04
	RF02 (3/92)	VT-1	Adjusting screws tackwelds RF01, 2
	RF01 (10/90)		
Jet Pump Diffuser	RF11 (3/08)		No inspections scheduled
	RF10 (3/06)		No inspections required
	RF09 (3/04)	UT	UT (TEJET / DF-1, DF-2, DF-3 and AD-2) of 11 Jet Pump diffusers. No

			indications found
	RF08 (3/02)		Diffuser welds were part of JP baseline
JP 16 thru 20	RF07 (3/00)		JP 5,6,15,16 Inlet mixers, crud buildup noted
	RF06 (5-98)		ISI Program plan has no special inspection frequency, it is performed during the code required B-N-1 examinations.
CRD Guide Tube	RF11 (3/08)	EVT-1 VT-3	1 guide tube examined in place, no indications found
	Mid-Cycle (11/07)	VT-1	Guide Tube Base to Body Weld CRGT-3 at core locations 1803 and 2203 from Lower Plenum. Approximately 30% coverage was obtained with VT-1 resolution. No indications found
	RF10 (3/06)	EVT-1 VT-3	1 guide tube examined in place, no indications noted
	RF09 (3/04)	EVT-1	6 guide tubes examined in place, no indications noted
	RF08 (3/02)	VT-1 EVT-1	9 guide tubes examined in place, no indications noted
	RF07 (3-00)		No inspections performed
	RF06 (5-98)		N/A
CRD Stub Tube	Only when accessible	VT	
	RF11		Inaccessible
	Mid Cycle (11/07)	VT-1	CRD Stub Tube to RPV (ST/RPV-1) weld at core locations 1803 and 2203. Approximately 30% coverage was obtained with VT-1 resolution. No indications found
		VT-1	Stub Tube Base Metal (Stub Tube) at

			core locations 18-03 and 22-03. Approximately 25% coverage was obtained with VT-1 resolution. No indications found
		VT-1	CRD Housing to Stub Tube Weld (CRDH/ST-1) at core location 22-03. Approximately 25% coverage was obtained with VT-1 resolution. No indications found
		VT-1	Bottom Head Cladding (RPV-BOT) at 202 degrees.100% of the accessible area was inspected with VT-1 resolution. No indications found
	RF10 RF09 RF08 RF07 RF06		Inaccessible Inaccessible Inaccessible Inaccessible Inaccessible
In-Core Housing	Only when accessible RF11 (3/08) RF10 RF09 RF08 RF07 RF06	VT	 Inaccessible Inaccessible Inaccessible Inaccessible Inaccessible Inaccessible
Dry Tube	RF11 (3/08) RF10 (3/06) RF09 (3/04) RF08 (3/02) RF07 (3/00) RF06 (5/98)	EVT-1 VT-1	Two (2) dry tubes inspected per SIL 409 R2. No indications found. Two (2) dry tubes inspected per SIL 409 R2. No indications noted. Two (2) original dry tubes replaced due to age. No inspections performed. 9 dry tubes examined per SIL409-R2, no indications noted No inspections performed

			RF06 (5-98) - Examined 12 Dry Tubes, 3 were reported separation at the collar to shaft interface
	RF05 (11/96)		
	RF04 (5/95)		Bent plunger found @RF04 Replaced @RF05
	RF01 (10-90)		
Instrument Penetrations	RF11 (3/08)	VT-2	Performed VT-2 on eleven (11) instrument nozzles. No indications found
	RF10 (3/06)		No inspections required
	RF09 (3/04)		No inspections performed
	RF08 (3/02)	UT	Nozzle N-14 (ICS) required by SIL 571, No indications found
	RF97 (3/00)		No inspections performed
	RF06 (5/98)		No Inspections performed
Vessel ID Brackets	RF11 (3/08)	EVT-1	Examined six (6) Jet Pump Riser Brace to RPV attachment welds at 30, 60, 120, 150, 240 and 270 degree locations. No indications found
	RF10 (3/06)		No inspections required
	RF09 (3/04)	EVT-1	Examined 2 JP riser brace attachments, no indications noted
	RF08 (3/02)	EVT-1	Examined 3 JP riser brace and 8 CS vessel attachment welds, no indications noted
	RF07 (3/00)		RF07 (3/00) - No inspections performed
	RF06 (5-98)		RF06 (5-98) - No Indications Jet Pumps 1 thru 10 riser brace welds
	RF04 (5/95)	VT	5 0% riser brace welds each outage No indications
	RF02 (3/92)		
	RF01 (10/90)		

LPCI Coupling	RF11 (3/08)		No inspections performed
	RF10 (3/06)		RF010, One coupling inspected. No indications found.
	RF09 (3/04)	EVT-1	No inspections performed.
	RF08 (3/02)	EVT-1	Examined the remaining 2 couplings, no indications noted
	RF07 (3/00)		Per BWRVIP guidelines one LPCI coupling was examined. No indications found
	RF06 (5-98)		No inspections performed
Steam Dryer	RF11 (3/08)		Completed baseline inspection of BWRVIP-139 and SIL-644. The following locations were visually inspected:
		VT-1	Cam Nut/Washer Tack Welds on all banks. Cracked tacks found at six locations. Use-As-Is Disposition
		VT-1	Four (4) Earthquake blocks – wear and deformation noted from misalignment during installation. Use-As-Is Disposition
		VT-1	Thirty four (34) upper and lower bank horizontal welds no indications found
		EVT-1	Two (2) drain channel vertical welds with previous indications. Some of the previous indications could not be found – no change noted in the remaining indications.
		VT-1	Six (6) hood high stress welds – no indications found.
		VT-1	Lifting eye to rod tack welds - cracked tacks found on all four (4) lifting rods. Use-As-Is Disposition

		EVT-1	Upper Support Ring – reinspected previously identified indications with no change noted. Identified several new indications. Use-As-Is Disposition
		VT-1	Twenty four(24) vertical bank welds - no indications found
		VT-1	Reinspected bent gusset plate on the 180 degree lower guide. No change from previous inspection.
		VT-1	Steam Dryer Upper Guides at 0 and 180 degrees – No indications found
	RF10 (3/06)	VT-1, VT-3 EVT-1	All BWRVIP-139 required inspections have been completed. Supplemental inspections of drain channels performed. Monitoring of cracking in upper support ring, no changes noted.
	RF09 (3/04)	VT-1, VT-3 EVT-1	RF09, Baseline SIL-644 exams completed. Repairs made to one hood due to cracking, opposite hood was preemptively repaired. Monitoring of cracking in upper support ring, no changes noted.
DM weld Inspections	RF11 (3/08)	Manual and Automated PDI supp 10	2RPV-KB32 N16 auto PDI Appx. VIII exam with "no recordable indications". In N2R11 the complete baseline of all BWRVIP-75A category A through E DM welds were inspected with PDI Appx. VIII supplement 10 In N2R11 2RPV-KB31-A N10 manual PDI Appx. VIII exam was performed with "no recordable indications" Note: 2RPV-KB31-A weld is a "Risk Informed" item classified as R-A R1.20, NMP2 has a total of 30 welds (28 category D welds, 2 category E welds and no category A, B or C DM welds as classified by BWRVIP-75A)

Reactor Internals Inspection History

Plant: **Quad Cities 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 (BWRVIP-76)	04/95	EVT-1 and UT	Inspections per BWRVIP Guidelines of all shroud repair design-reliant hardware prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspection of shroud consisted of EVT-1 of all ring segment welds (100% of accessible ring surfaces examined), EVT-1 of vertical welds between H1 & H2 OD surface >35% length/weld (ID not accessible), UT of all 6 beltline vertical welds >30% length/weld, and EVT-1 of vertical welds between H6 & H7 OD surface >22% length/weld (ID not accessible). Approximately 51" of 356" examined at the core plate support ring weld (HAZ of H5) had indications (H5 is structurally replaced by comprehensive shroud repair). All other areas examined had No Reportable Indications. Performed EVT-1 on all shroud vertical welds adjacent to beltline (six verticals, 100% of accessible OD surfaces). No Reportable Indications.
	03/97	EVT-1, VT-3	Performed VT-3 of all four tie-rod assemblies. One reportable indication related to original installation of locking device at upper spring, not service induced. Properly latched locking device.
	01/00	ET/UT	Performed automated volumetric examination (TEIDE 2 tooling) of shroud vertical welds V-14 through V-19 in accordance with BWRVIP-03, BWRVIP-07 and BWRVIP-63. No Reportable Indications.

	02/02	EVT-1	6 vertical welds from the OD per BWRVIP-76. No indications.
	03/04	EVT-1	Examined six welds, including 3 welds inaccessible to UT and three with only single side access. No reportable indications.
	04/06	EVT-1	Ring segment vertical welds. Since the location of the welds was not known, examined 100% of the ring segments. No reportable indications in vertical welds. Indications adjacent to weld H-5 were noted; however, the shroud tie rods structurally replaced this weld.
	03/08	EVT-1	Examined accessible areas of the 6 non-beltline vertical welds from the OD. No reportable indications.
Shroud Support (BWRVIP-38)	04/95	EVT-1	EVT-1 of H8 and H9 for approx 10" -12" at 4 locations of shroud repair hardware attachment areas. Access hole covers; VT/UT in 1991, circ indications observed and permanent repair installed 1993.
	01/00	EVT-1	Performed visual examination of H8 and H9 in accordance with BWRVIP-38 adjacent to AHC between jet pumps #20 - #1 (e.g. at least 10% of total circumference examined). No Reportable Indications.
	04/06	EVT-1	Examined >10% of H8 and H9 from annulus adjacent to AHC between jet pumps #10 - #11. No Reportable Indications.
Shroud Repair Hardware (BWRVIP Letters 2006-112 and 2006-220)	04/06	EVT-1, VT-3	EVT-1 of all tie rod upper support vertical faces, VT-3 of high-stressed fasteners and other contact points, and overall VT-3 per BWRVIP Letters 2006-112 and 2006-220. Also, VT-3 of core plate wedges adjacent to repair hardware.

			No reportable indications.
Core Spray Piping (BWRVIP-18)	1980's to 1996	VT-1 (1 mil)	IEB 80-13/NUREG of piping and welds in annulus. No indications observed.
	03/97	UT, EVT-1	UT or EVT-1 performed in accordance with BWRVIP-18. Two indications (1.60" and 2.25" in length) observed at slip joint (P6), evaluated for at least 48 months of hot operation.
	01/00	EVT-1	Performed visual examination of P4d and P8a (4 connections) and P2 at both T-boxes in accordance with BWRVIP-18. No Reportable Indications.
	02/02	UT	BWRVIP-18 UT examinations of all accessible welds (32). No relevant indications.
		EVT-1 on Piping	BWRVIP-18 EVT-1 on 5 welds inaccessible to UT. No indications.
	03/04	EVT-1	Examined 100% of P8a & P4d target welds. No relevant indications.
	04/06	UT	BWRVIP-18 UT examinations of all accessible welds (32). No relevant indications.
		EVT-1	Examined two P4a, one P4b, one P4c, four P4d, two P8a and two P8b welds. No relevant indications.
	03/08	EVT-1	Examined all four P4d, all four P8a and all four P8b welds. No relevant indications.
Core Spray Sparger (BWRVIP-18)	1980's to 1996	VT-1 (1 mil)	IEB 80-13/NUREG of welds on sparger. No indications found
	03/97	CSVT-1, VT-3	CSVT-1, VT-3 performed in accordance with BWRVIP-18, geometry tolerant. No Reportable Indications.
	01/00	N/A	No examinations performed.

	02/02	EVT-1 of S1, S2, & S4; VT-1 of S3: VT-1 of brackets	Examined 50% sparger nozzles, 100% of the S3a, S3b, & S3c nozzle welds, and 100% of S1, S2 and sparger bracket welds. Examined for IEB 80-13 and BWRVIP-18. No indications.
	04/06	EVT-1 of S1, S2, & S4; VT-1 of S3: VT-1 of brackets	Examined 50% sparger nozzles, 100% of the S3a, S3b, & S3c nozzle welds, and 100% of S1, S2 and sparger bracket welds. No Reportable Indications.
	03/08	N/A	No examinations performed.
Top Guide (Rim, etc.) (BWRVIP-26)	04/95	VT-1	VT-1 of 5 cells. No indications. VT-1 of alignment assemblies. No indications.
	04/97	VT-1	VT-1 of alignment assemblies and adjacent rim weld. No Reportable Indications.
	01/00	N/A	No examinations performed.
	02/02	EVT-1, VT- 1	Inspected 2 alignment assemblies (VT-1) and accessible rim welds (EVT-1) per BWRVIP-26. No indications.
	03/04	EVT-1	Inspected two Guide Aligner Pins and rim welds at adjacent locations. No recordable indications.
	03/08	EVT-1, VT-1	Examined the rim weld adjacent to all four aligner pins. Not able to claim any EVT-1 coverage per BWRVIP-03 Rev. 10. Obtained 50% VT-1 coverage per BWRVIP-03 Rev. 10. No reportable indications. Actual exam coverage same as previous – change is due to change in EVT-1 definition.
Core Plate (Rim, etc.)	N/A	N/A	Core Plate Wedges installed 4/97.

(BWRVIP-25)	04/06	VT-3	Examined core plate wedges as part of shroud repair (tie rod) inspections. No Reportable Indications.
SLC (BWRVIP-27)	01/00	UT	Performed augmented (non PDI) volumetric examination of nozzle to safe-end weld. No Reportable Indications.
	03/04	PT	Performed surface examination of Nozzle To Safe End weld. No Reportable Indications.
	03/08	UT	UT in accordance with ASME Section XI Appendix 8 Supplement 10 was performed on the Unit 2 nozzle-to-safe end weld with acceptable results.
Jet Pump Assembly (BWRVIP-41)	03/93	VT-1	JP#7 and JP#18 set screws backed out, repaired and tack welded.
	04/95	VT-1	Hold down beams, beam bolt keepers, lock plates and retainers; restrainer wedges, stops, and adjusting screws, clamp bolts and keepers; riser brace assemblies, adapter and baffle plate welds, sensing lines and sensing line brackets per various SILS. No Reportable Indications. Inspect 100% every other outage.
	04/97	UT	Performed UT examination of jet pump beams. JP#7 beam rejectable indication at center hole region. Beam replaced.
	01/00	UT/EVT-1	Performed UT examination of jet pump beams using technique capable of detecting cracking at throat and ears. NO Reportable Indications. Performed visual examination of RS-1,-2,-3 riser welds. No Reportable Indications.
		UT/ET or EVT-1	Performed examinations of at least 50% of the medium and high priority jet pump assembly welds in accordance with BWRVIP-41 using combination of automated (e.g. TEJET tooling)

			volumetric and visual techniques. JP#15 observed possible wedge (WD-1) movement, expanded inspection to include restrainer components, with no relevant indications. All other components No Reportable Indications.
	02/02	EVT-1, VT-1	Jet pump beams were replaced on 18 jet pumps. EVT-1 and VT-1 of 18 beams; pre- and post replacement (pumps 7 and 18 not replaced because they already had BWR-4 style beams) A gap was identified on jet pump 1, and a setscrew was missing on jet pump 17. Auxiliary wedges were installed at these locations. Additionally, the set screws on pumps 7 and 18 and the riser braces for jet pumps 17 and 18 were inspected. Jet pump sensing line clamps were installed on 8 jet pumps (1, 2, 3, 10, 11, 12, 13, 20)
	03/04	EVT-1	Examined 50% of jet pump high priority welds (AD-1, AD-2, DF-2, AD-3a, AD-3b, RS-1, and RS-2, RS-3). Examined a mix of jet pump medium priority welds (MX-1, MX-2, MX-4, RB-1, RB-2, RS-4, RS-5, RS-8, RS-9). No reportable indications.
		VT-1	Examined all 20 jet pump WD-1 main wedges. Found very minor wedge movement on 2 jet pumps, severe movement on one jet pump, and one actuating rod resting against - and wearing into - the guide sleeve. All evaluated for another cycle.
	04/06	EVT-1, VT-1	EVT-1 of 17 high-priority RS-1, RS-2 and RS-3 welds. VT-1 of all 20 main wedges (WD-1). Found signs of wedge movement on four jet pumps. Replaced the restrainer gate and installed a mitigating slip joint clamp as planned on the pump with the most severe movement. No significant change

			since 2004 on the other jet pumps. The other jet pumps were evaluated for another cycle.
	03/08	EVT-1	Inspected 10 each DF-2, AD-3a,b AD-1 and AD-2 high priority welds Inspected 8 medium priority Riser Brace welds (RB-1a, 1b, 2a, 2b), 16 medium priority riser welds (RS-4,5,8,9. 27 medium priority MX1, MX=3a, MX-3b welds, and 10 medium priority DF-1 welds.
		VT-1	Inspected all 20 Jet Pump main wedges (WD-1), and Aux wedges and set screws on 2 jet pumps. A second aux wedge had to be installed on JP17, which already had one aux wedge. Inspected 5 restrainer bracket posts retainer tack welds.
		VT-3	Inspected medium priority bolting on inlet-to-mixer clamps (IN-5) on 10 jet pumps. Inspected new restrainer bracket and slip joint mitigation clamp on one jet pump.
CRD Guide Tube (BWRVIP-47)	04/97	VT-3	Performed visual examination of CRGTs G-7 and H-8 while removed from core. No Reportable Indications.
	02/02	VT-1, VT-3 on CRGT-1; EVT-1 on CRGT-2 & 3	Examined 6 sets of guide tube welds (CRGT-1, CRGT-2, and CRGT-3) per BWRVIP-47. No Indications. Examined 6 pin welds (FS/GT-ARPIN-1). No Indications.
	03/04	EVT-1, VT-3	Examined 3 sets of guide tube welds (CRGT- 1, CRGT-2, and CRGT-3). Examined 3 pin welds (FS/GT-ARPIN-1). No Indications
	04/06	EVT-1, VT-3	Examined 4 sets of guide tube welds (CRGT- 1, CRGT-2, and CRGT-3) and FS/GT-

			ARPIN. No Indications.
	03/08	EVT-1, VT-3	Examined 5 pin/welds (FS/GT-ARPIN-1) and 5 each CRGT-1, CRGT-2 and CRGT-3 per BWRVIP-47 to complete baseline. No Reportable Indications.
CRD Stub Tube	N/A	N/A	N/A
In-Core Housing	N/A	N/A	N/A
Dry Tube (GE SIL-409 and BWRVIP-47)	04/97	VT	Replaced 6 dry tubes 1997. Dry tubes examined every other outage. Plunger engagement verified each outage.
	01/00	VT	Verified plungers engaged at Top Guide. NO Reportable Indications.
	02/02	MVT-1	Examined 6 dry tubes. Indications observed on 5 dry tubes, and authorized for one additional cycle of operation.
	03/04 04/06 03/08	N/A	No inspections required until 2016. All original dry tubes have been replaced.
Feedwater Spargers (BWRVIP-48)	1983	Manual UT	UT of all four N4 nozzles and inner radii. NRI
	1986	Manual UT	UT of all four N4 nozzles and inner radii. NRI
	1990	Manual UT	UT of all four N4 nozzles and inner radii. NRI
	1993	Manual UT	UT of all four N4 nozzles and inner radii. NRI
	1995	UT (GERIS)	UT of all four N4 nozzles and inner radii. NRI
	02/02	VT-1	Examined all Feedwater Spargers. Examined per NUREG-0619 program and BWRVIP-48. No indications.

	2004	UT (GERIS)	UT of all four N4 nozzles and inner radii. Acceptable.
	04/06	VT-1, VT-3	VT-3 overall condition and VT-1 bracket welds of all FW sparger end brackets. Three FW sparger end brackets showed signs of wear where the pins had worn into the brackets. All stop pin nuts were welded to the pins as a pre-planned measure.
	03/08	VT-1, VT-3	Visual inspection of sparger end brackets. Seven of eight brackets have some amount of acceptable wear. OE26726.
Instrument Penetrations (BWRVIP-49)	04/97, 01/00, 02/02, 03,04, 04/06, 03/08	VT-2	VT-2 system leakage test. Acceptable.
Vessel ID Attachments (BWRVIP-48)	04/95	VT-1, VT-3	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. VT-3, or VT-1 if in beltline region. No Reportable Indications.
	02/02	VT-1, EVT-1, VT-3	Inspected 8 core spray brackets, 4 feedwater sparger brackets, and 4 steam dryer wall support brackets per BWRVIP-48. No indications.
	03/04	VT-1, EVT-1, VT-3	Examined dryer support lugs and surveillance specimen brackets, with no reportable indications. Examined steam separator and steam dryer guide rod bracket welds. One separator guide rod was bent, but the welds had no reportable indications. Examined feedwater sparger end brackets. One FW sparger end bracket pin was missing a lower nut. A new nut was welded into place.
	04/06	EVT-1, VT-3	Performed BWRVIP-48 and ASME Code inspections of four steam dryer wall support lugs. All four lugs

			sustained some damage during May 2005 installation of new steam dryer, but all lugs acceptable as-is. No recordable indications in welds.
	03/08	EVT-1, VT-3	Performed follow-up exams all 4 steam dryer wall support lugs. No additional damage except for expected wear and tear.
RPV Internal Surfaces (Cladding) (ASME B.N.1)	02/02	VT-3	VT-3 visual examination for ASME Section XI, B-N-1 of RPV internal surfaces for 360 degrees between steam dam and flange. No indications.
	03/04	VT-3	VT-3 visual examination for ASME Section XI, B-N-1 of RPV internal surfaces for 360 degrees between steam dam and shroud support plate flange. No indications.
	03/08	VT-3	ASME Section XI VT-3 of RPV internal surfaces credited to other exams in annulus area in accordance with Relief Request for alternate examination methods for B-N-1 and B-N-2 components.
LPCI Coupling	N/A	N/A	Not applicable to Quad Cities.
Steam Dryer (GE SIL-644 and BWRVIP-139)	02/02	VT-3	The dryer was modified to accommodate the Extended Power Uprate. The modification installed a mechanical device on the outlet of the dryer chevrons that would more uniformly distribute the velocity through the dryer and increase moisture removal. General Condition Inspection (VT-3) of general top-view post-modification. No indications.
	03/04	Best Effort VT-1, VT-3	Conducted the following inspections per GE SIL-644 S1: Best effort VT-1 inspections of 100% external vertical and horizontal welds, tie

			bars, and perforated plates; Best effort VT-1 inspections of 100% internal vertical and horizontal hood welds, struts and supports, plates, drain channels; VT-3 inspections of dryer skirt welds (internal and external). Repaired indications in drain channel-to-skirt welds and tie bar welds, and at outer hood gussets and a stiffener plate added after previous dryer failures. Also found indications (acceptable as-is) at the following locations: Internal struts, vane assembly end plate supports, internal hood welds, guide channels, one drain channel, a hold down assembly tack weld, and perforated plate welds.
	04/06	Best Effort VT-1, VT-3	Performed baseline inspection of new steam dryer installed in May 2005 per BWRVIP-139 and GE recommendations. Inspection scope expanded due to indications found in vane bank end plates, gussets, and damage to skirt. The following damage was attributed either directly or indirectly to a lifting event during the original attempt to install the dryer in May 2005: fatigue cracks and distortion in the dryer skirt and base plate support lug cutouts, fatigue crack in a gusset attached to a vane assembly end plate, and a cracked latch box. The following indications were attributed as noted: lifting eyes rotated (design weakness), stress relief cracking in vane assembly plates (original construction issue), and distortion in perforated plates (original construction issue).
	03/08	Best Effort VT-1, VT-	Inspections per BWRVIP-139 and GE recommendations, including all previous

		3	indications and at least 50% of areas similar to those that were cracked. There were no apparent changes to any of the previous indications, and no new recordable indications.
Dissimilar Metal Welds (BWRVIP-75-A Cat. A)	03/08	UT	Examined 7 Category A welds per BWRVIP-75 and ASME Section XI, Appendix VIII, Supplement 10. No flaws were identified and no weld overlays were performed. 100% of the required exam volumes were inspected on all of the welds. Three of the exams were manual. Four welds contained a stainless steel inlay. Automated exams were performed on those four welds.
Dissimilar Metal Welds (BWRVIP-75-A Cat. B)	03/08	N/A	No Category B welds examined
Dissimilar Metal Welds (BWRVIP-75-A Cat. C)	03/08	UT	Examined 4 Category C welds per BWRVIP-75 and ASME Section XI, Appendix VIII, Supplement 10. No flaws were identified and no weld overlays were performed. 100% of the required exam volumes were inspected on all of the welds. Three of the exams were manual and one was automated. One weld contained Alloy 82/182 butter, which was also the weld on which the automated exam was performed.
Dissimilar Metal Welds (BWRVIP-75-A Cat. D)	03/08	N/A	No Category D welds examined

Reactor Internals Inspection History

Plant: **River Bend**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	94	VT-1/VT-3	Partial inspection during forced outage. Welds H-3 thru H-7, Limited vertical weld inspection. No indication detected.
	96	VT-3	ASME XI inspection of accessible areas including the grid. No indications detected.
RF-7	97	UT	UT from OD, Welds H3, H4, H6A, H7 (No indications)
RF-12	Oct 2004	UT	UT From OD: Welds H6A and H7 (no indications)
RF-14	Jan. 2008	UT	H3 no indications 76.6% inspected H4 indications 92.7% inspected 9% weld flawed
Shroud Support	94	VT-1/VT-3	Inspection of accessible areas during forced outage. Access hole cover; VT. No indications.
	96	VT-3	Access hole cover. No indications.
RF-8	1999	VT-1	Access hole cover. No indications
RF-9	2000	EVT-1	Shroud Support to Shroud (No Indications)
RF-9	2000	EVT-1	Support Plate to Shroud (No Indications)
RF-10	Oct. 2001	VT-1	Access Hole Cover- No indications
RF-12	Oct 2004	VT-1	Access Hole Cover (No indications)
RF-12	Oct. 2004	UT	UT From Bio-shield wall H8 & H9 (no indications)
RF-14	Jan 2008	VT-1	Access hole cover NRI

Core Spray Piping	1987 to 1997	VT-1/VT-3	Piping and welds in annulus, every other cycle , starting 1994 every cycle. No indications.
RF-7	1997	EVT-1/MVT-1	BWRVIP-018 (Baseline Inspection) No indications
RF-8	Apr 1999	EVT-1/MVT-1	BWR VIP-018 No Indications
RF-9	March 2000	EVT-1/MVT-1	BWR VIP-018 No Indications
RF-10	Oct. 2001	UT	12 welds examined No Indications
RF-11	March 2003	EVT-1	17 welds examined No Indications
RF-12	Oct 2004	UT	8 welds examined No indications
RF-13	April 2006	EVT-1	8 welds examined No indications
RF-14	Jan. 2008	EVT-1	8 piping welds and 4 brackets examined No indications
Core Spray Sparger	1987 to 1997	VT-1/VT-3	Nozzles, end caps, support (guides) , every other outage. Selected Tee (welds) every other outage. All tee (welds), end caps and nozzles each outage starting 1996.
RF-7	1997	EVT-1/MVT-1	BWRVIP-018 (Baseline Inspection) No indications
RF-8	Apr 1999	EVT-1/MVT-1	BWRVIP-018 No Indications
RF-9	March 2000	EVT-1/MVT-1	BWRVIP-018 No Indications
RF-10	Oct.2001	EVT-1, VT-1	BWRVIP-018-No indications
RF-11	March 2003	EVT-1/VT-1	36 welds examined No indications
RF-12	Oct 2004	EVT-1/VT-	32 items examined no indications

		1	
RF-13	April 2006	EVT-1/VT-1	15 items examined no indications
RF-14	Jan 2008	EVT-1/VT-1	42 items examined Includes spare brackets pin/pads and pads only – one indication identified on alignment pin
Top Guide (Rim, etc.)	1987 to 1997	VT-3	100% per Interval (Hold down studs, nuts and keeper). No indications.
RF-14	Jan. 2008	VT-3	ASME examination - No indications
Core Plate (Rim, etc.)			
RF-14	Jan 2008	VT-3	8 exams (Jet Pump disassembled)
SLC			
RF-12	Oct 2004	Enhanced VT-2	VT-2 inspection of N11 nozzle at vessel hydro No leakage observed
RF-13	April 2006	Enhanced VT-2	VT-2 inspection of N11 nozzle at vessel hydro No leakage observed
RF-14	Jan 2008	Enhanced VT-2	VT-2 inspection of N11 nozzle at vessel hydro No leakage observed
Jet Pump Assembly	1987 to 1997	VT-1/VT-3	Twenty pumps. 1/3 inspected each period first Interval(Diffuser Assembly, Riser Assembly, Riser Braces, inlet suction area, riser brace, wedge assembly, Hold down beam (bolt keeper and tack welds). Wedges, adjusting screws (tack welds), sensing lines receive VT per various SILs. Jet Pump Beams replaced 1994. VT of complete assemblies in 1994 forced outage.
RF-7	1997	EVT-1 MVT-1 MVT-1	Jet Pump Riser Elbow Welds No indications Jet Pump Riser Brace Welds (6 of 10) No indications

RF-8	1999	EVT-1	Restrainer Assembly (6 of 10) No movement
RF-10	Oct. 2001	EVT-1	Riser Pipe to Transition Piece (Limited Access) No Indications (5 ea) Inlet elbow to sleeve weld, inlet sleeve to nozzle weld, restrainer bracket wedge, riser pipe of the upper brace and lower brace attachment yoke welds (6 welds inspected)
RF-11	March 2003	EVT-1	RB welds 14 welds examined JP-11 thru 20, No Indications RS-3 weld 5 welds examined JP-11 thru 20 No Indications RS-6 weld 10 welds examined JP-11 thru 20 No Indications RS-7 weld 10 welds examined JP-11 thru 20 No inactions RS-8 weld 5 welds examined JP-11 thru 20 No Indications RS-9 weld 10 welds examined JP-1 thru 20 One indication found JP-19/20 riser brace IN-1/IN-2 weld 10 welds each examined JP-11 thru 20 No indications found DF-1, DF-2, DF-3A, DF-3B weld 10 welds each examined JP-11 thru JP-20. No indications found. AD-2 weld 10 welds examined JP-11 thru JP-20 No indications found WD-1 weld 6 welds examined JP-11,12,13,14,19 and 20 No indications found
RF-12	Oct. 2004	EVT-1/VT-1	RS-9 previous crack found in RF-11(Qty 1) & RS-8 (Qty 1) & WD-1 (Qty 1)
RF-13	April 2006	EVT-1	RS-9 reinspection previous crack & RS-8
RF-14	Jan. 2008	EVT-1/VT-1	JP-19/20 –RS-8 & 9 AD-1, AD-2, DF-3a, b , IN-1 & 2, WD-1, DF-1, 2 (Jet Pump disassembly) JP-1 thru 20 RB-1a,b,c,d, No indications except for previously reported RS-9 indication

RF14	Jan 2008	UT	18 Jet Pump Beams (two replaced with new beams)
CRD Guide Tube RF-11	March 2003	EVT-1 / VT-3	Inspected 15 control rod drive housings – No indications observed.
CRD Stub Tube	N/A	N/A	N/A
CRD Guide Housings RF-11	March 2003	EVT-1 / VT-3	Inspected 15 control rod drive housings – No indications observed.
In Core Dry Tube RF11 RF14	 1992 March 2003 Jan 2008	 VT-3 VT-1	 Inspected accessible tubes during bottom head drain line replacement. No indications observed. IRM/SRM dry tubes QTY 10 inspected No indications Inspected 7 IRM Dry Tubes – 3 with recordable indications Inspected 4 SRM Dry Tubes – 2 with recordable indications
Instrument Penetrations	1994	VT-3	Inspected penetration at vessel during forced outage. No indications noted.
Vessel ID Brackets Vessel Interior Vessel Brackets RF-14 Vessel Interior	1987 to present Oct 2004 Jan 2008 Jan 2008	VT-1/VT-3 VT-3 VT-3, EVT-1 VT-3	Section XI inspections once per interval. VT-3, or VT-1 if in beltline region. No indications noted. Vessel cladding area as required by section XI No indications Feedwater brackets, Core Spray brackets,Steam Dryer brackets NRI Vessel Cladding - NRI
LPCI Coupling	1989, 92	VT-3	Two of three lines in 1989 and two of three lines in 1992. No indications.

RF-8	1999	MVT-1	No Indications (1 ea.)
RF-9	2000	EVT-1	No Indications (2 ea.)
RF-12	2004	EVT-1	9 welds inspected No indications
Steam Dryer RF-9	2000	EVT-1	Indications identified CR-RBS-0686
RF-10	2001	EVT-1	Indications less than 4.5 inches
RF-11	2003	EVT-1	Indications less than 4.5 inches
RF-12	2004	VT-3	Indications less than 4.5 inches
RF-13	2006	EVT-1	New Indication identified dryer skirt ¾"long Ref. CR-RBS-2006-01770, indications identified in RF-9 less than 4.5"
RF-14	Jan 2008	VT-1	BWRVIP-139 exam – identified 2 cracks requiring repair. Upper support ring had one indication 5" and another 5.25" long.
Feedwater Sparger			
RF-7	1997	VT-1	Repair areas, No Indications
RF-8	1999	VT-1	Repair areas, No Indications
RF-9	2000	VT-1	Repair areas, No Indications
RF-10	2001	VT-1	Repair areas, No Indications
RF-11	2003	VT-1	Repair areas, No Indications
RF-12	2004	EVT-1	Repair areas, No Indications
RF-13	2006	EVT-1	Repair areas, No Indications
RF-14	Jan. 2008	EVT-1/VT-3	Qty-8 Brackets to vessel and end brackets -End brackets had wear on pins
SHASM Retaining Pin			
RF-11	2003	VT-3	No Wear Noted
RF-12	2004	VT-3	No wear noted Qty 12 inspected
RF-13	2006	VT-3	No wear noted Qty 12 inspected
RF-14	Jan 2008	VT-3	No Wear noted Qty 12 examined

Below Core Plate RF-14	Jan. 2008	VT-3	QTY 16 items examined NRI
IGSCC Category "C" DM welds (containing alloy 82/182 weld material) RF-14	Jan. 2008	Automated	Completed qualified ASME Section XI, Appendix VIII, Supplement 10 examinations on: • Remaining seventeen welds • No Flaws were identified • No overlays were required

Reactor Internals Inspection History

Plant: **Susquehanna 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	1993, 1995, 1996, 1997, 1998 and 2000 results.	VT-1 and UT	7 RFO (Fall 93), (VT-1) the OD of H3, H4, and H5, and the corresponding vertical welds in the 0 to 135 degree azimuth. No Recordable Indications.
		UT	8 RIO (Spring 95), circumferential welds H1 through H7 inspected ultrasonically using GE OD Tracker system. Cracking found in H1, H2, H4, H5, H6A, and H6B. Most significant in degrees of cracking were H2), H4), H5), and H6B). Structural margins were maintained based on BWRVIP documents GENE-523-113-0894, Rev 1, and Supplement 1, Rev 1, and independent calculations.
		UT	9 RIO (Fall 96), partial ultrasonic inspection of shroud ultrasonically for crack growth information using the OD Tracker. Weld areas inspected were H1, H2, H4, H5, and H6B. Structural margins were maintained based on BWRVIP documents GENE-523-113- 0894, Rev 1, and Supplement 1, Rev 1, and independent calculations.
		UT	Unit 1 10 RIO (Spring 98), Partial UT examinations of the H4 and H5 welds were made in the 0 and 180 degree azimuth locations previously uninspected. On the H4 weld 3 new indications were found. The H5 weld did not have any indications in the inspected region.
		VT-1 Enhanced	The vertical weld designated H5/H6A-135 was visually inspected on the OD for 41" and on the ID for 24" on both sides of the weld. No Recordable Indications.

		UT	11 RIO (Spring 2000) Horizontal welds H4 and H5 were re-examined using the TEIDE tool from Spain. Full 360 degree UT examination revealed 60.3% of H4 cracked and 47.1% of H5 cracked, mostly on the ID of the shroud. Safety margins were calculated for each weld and analysis showed 6 years of useable life for the H4 weld and 10 years for the H5 remained before reinspection required using BWRVIP-76 techniques.
		UT/VT-1E	1-11 RIO (Spring 2000) vertical welds: Seven (7) vertical welds were examined using either UT or VT-1/1E techniques selected using BWRVIP criteria. One weld, V-15 @ 180 degrees between H4/H5 welds, showed a small defect 0.94" long and 0.37" deep. This weld met safety limits, but would have to be reinspected in 6 years.
	2004	UT	Unit 1 13RIO (Spring 2004) circumferential welds H1, H2, H3, H4, H6A, H6B, and H7 inspected ultrasonically using GE OD Tracker system. Additional cracking found in H1, H2, H4, H6A, and H6B. Most significant in degrees of cracking were H7), H4(, and H6A. Structural margins were maintained based on BWRVIP documents and independent calculations.
	2006	EVT-1	U1 -14RIO EVT-1 single sided exam of vertical welds per BWRVIP-76. No Recordable Indications.
		VT-3	Shroud flange exam 120 degrees of circumference to satisfy ASME XI core support structure. No Recordable Indications.
	2008	VT-3	Shroud flange exam additional 120 degrees of circumference to satisfy ASME XI core support structure. No Recordable

			Indications.
Shroud Support	1993	VT-1	Shroud Support legs inspected in 1993 during Jet Pump Beam replacements. No Recordable Indications.
		VT-1	VT-1 of 0 deg to 360 deg of H8 and H9 during the first interval. No Recordable Indications.
	1995	EVT-1	Unit #1 8 RIO (Spring 95), H8 and H9 examined (enhanced VT-1) for 360 deg of accessible area. No Recordable Indications.
	1996	EVT-1, UT	Unit #1 9 RIO (Fall 96), 18 inch indication found behind AHC at 180 deg at the shroud support horizontal plate to shroud cylinder plate weld H8 while performing AHC inspections. UT performed of the accessible areas of the indication. Inspected (enhanced VT-1) remaining accessible areas of H8 and 360 deg of accessible H9 without any additional recordable indications. Structural margins were maintained.
	1998	UT	10-RIO (Spring 98) the H9 weld was inspected 100% from the OD of the vessel and No Recordable Indications. The H8 weld was inspected over 10.21% or 64.4" of the circumference from the OD of the vessel and No Recordable Indications.
		EVT-1	EVT-1 examinations were performed on shroud weld H8 at 180 deg. to verify a previously noted crack adjacent to the Access Hole Cover. The indication was determined to be non-relevant due to dark grit built up at the weld toe.
	2004	VT-1	13 RIO (Spring 2004) AHC at 0 and 180 degrees. No Recordable Indications.
		VOL/VT-3 EVT-1/VT-	H9 inspected from vessel OD 31% For VIP-38. No Recordable Indications.

		3 VT-3 EVT-1/VT-3	 H8 inspected 25% per VIP-38 and ASME XI. No Recordable Indications. Shroud support legs and welds, all 13 per VIP-38 with GE remote Firefly inspection tool. No Recordable Indications. 15 RIO AHC at 0 and 180 degrees. No Recordable Indications in 180 degree Top Hat design. Approximely .070 inch radial IGSCC crack in 0 degree in weld HAZ into cover plate. Use-As-Is
	2008		
Core Spray Piping	1980's to 1995	VT-1, VT-3	Piping and welds in annulus. No Recordable Indications.
	1996	VT-1 enhanced, UT	9 RIO Inspect per BWRVIP-18, no relevant indications though one indication was ultrasonically examined and no depth was recorded.
	1998	VT-1E and VT-3	10 RIO Inspect per VIP –18. No Recordable Indications.
	2000	EVT-1	11 RIO Inspect per VIP –18. No Recordable Indications.
	2002	UT & EVT-1	12 RIO (spring 2002) Inspect per VIP-18. No Recordable Indications.
	2004	EVT-1	13 RIO Inspect per VIP –18, for welds that cannot be inspected by UT P8A, P4D, P4A. No Recordable indications were observed
	2006	UT	14RIO Inspect per BWRVIP-18A, UT 23 welds, P2, P3, P5, P7, P4a, P4b, P4c. No Recordable Indications.
		EVT-1	EVT-1 for 9 welds without an approved UT method, P4d, P8a, P8b. No Recordable Indications.
		VT-1	VT-1 of Core Spray Brackets (8) No

			Recordable Indications. No Recordable Indications.
	2008	EVT-1	15 RIO EVT-1 of Core Spray piping per BWRVIP-18A. All P2, P3, P8a, and P8b welds. One each P4c and P4d. No Recordable Indications.
Core Spray Sparger	1980's to 1995 1996	VT-1,VT-3 VT-1, VT-3	No recordable indications, but one indication found in 1985 on S2, 173 degrees was identified. 9RIO Inspect per BWRVIP-18. Cracking found visually on shroud ID at #4 Core Spray Support Bracket. Determined acceptable to Use-as-is.
	2000	EVT-1	11 RIO – No Recordable Indications.
	2002	EVT-1	12 RIO – Linear indication core spray sparger tee box S2 weld @173 degrees. This was the same indication identified in 1985. It was evaluated for use as is since it did not grow in size over 17 years.
	2004	EVT-1, VT-1, UT	13 RIO – VT-1 8 sparger brackets. Cracking at Bracket 04 on shroud side inspected for sizing by UT and analyzed per VIP-76 vertical weld criteria. Determined acceptable to Use-as-is.
	2006	EVT-1	14 RIO EVT-1 of sparger piping both loops, S1, S2, and S4. No Recordable Indications. S2 weld at 173 degrees inspected, no growth noted. VT-1 of 50% of sparger welds S3a, S3b, S3c, S4. One of three tack weld found cracked during S3a inspection in orifice to elbow. Per GE analysis only two are required for structural integrity. VT-1 of five sparger brackets. Six sparger brackets, SB01 through SB06. Visual re-inspection of SB04 to verify no visible growth in shroud side crack.
	2008	EVT-1, VT-	15RIO VT-1 of six sparger brackets

		1	original scope. Bracket 11 Crack approximately 1 inch in length on shroud side of bracket observed. Determined acceptable Use-as-is. Scope expanded to the six brackets inspected in 2006. No growth observed in SB04 reinspection. No Recordable Indications in all remaining brackets.
Core Plate (Rim, etc.)	to date	VT-1 of surface welds and bolt tack welds on upper surfaces VT-3 of bolt and upper surface and cross-members	Unit #1 has not been accessible for inspection to date.
	2004	VT-3	13 RIO VT-3 of Core Support Plate Bolts and Tack welds from under-side with GE Firefly remote tool. No Recordable Indications. VT-3 of Core Plate surfaces and welds during CRGT inspections. Satisfy VIP-25 and ASME XI. No Recordable Indications.
	2008	VT-3	VT-3 of Core Plate surfaces and welds during CRGT inspections. Satisfy VIP-25 and ASME XI. No Recordable Indications.
SLC	92	VT-3	SLC 6 RIO One side of the Standby Liquid Control Standpipe inspected. Disassembly of the jet pumps for a Power Uprate modification made inspection possible. No Recordable Indications.
	2002-2008	EVT-2	Enhanced VT-2 during vessel post outage leak check. No Recordable Indications.

Top Guide	2008	EVT-1	15RIO EVT-1 of one Top Guide location to satisfy BWRVIP-26A. No Recordable Indications.
Jet Pumps	93-96	VT-1, VOL, VT-3	Riser brace welds inspected every other outage. Jet pump beam volumetric exams once in ten years. Remaining components (welds (VT-1), set screws (VT-3), wedges (VT-3), sensing line clamps (VT-1 & VT-3), tack welds (VT-1), etc are once per period. Jet pump beams replaced.
	1993	VT-1M	7 RIO Beams replaced. Non-rejectable gaps in set screws reported over several outages.
	1998	VT-1 & EVT-1	10 RIO . Jet Pumps 11-20 were inspected per BWRVIP-41 guidelines. No Recordable Indications.
	2000	VT-1 & EVT-1	11 RIO Jet pumps 01, 02, 03, and 04 inspected per BWRVIP-41. No Recordable Indications.
	2002	VT-1 &EVT-1	12 RIO Jet Pumps 05, 06, 11, and 12 inspected per BWRVIP-41, all jet pump set screw gaps measured, all wedges inspected. Excessive set screw gaps on JP–02 (shroud side set screw), JP-11 (shroud side set screw), JP-12 (shroud and vessel side set screws), JP-13 (vessel side set screw), JP-17 (shroud and vessel side set screws), and JP-20 (shroud side set screw). A total of eight auxiliary spring wedges installed. in the above listed jet pumps. Additional riser brace inspections were performed on JP-02, 11, 12, 13, 17 and 20. No Recordable Indications.
	2004	UT	13 RIO UT of all 20 Jet Pump Beams, BB-1, BB-2 only. No Recordable Indications.
		EVT-1	EVT-1 of remainder of VIP-41 high priority welds, AD-1, AD-2 RS-1, RS-1A, RS-2, RS-3. No Recordable Indications.

		VT-1	VT-1 of jet pump wedges and set screw gaps pre-modification and post-modification. All 20 jet pump inlet mixer labyrinth seal EDM machining. New oversized wedges and wedge rods installed on 5 pumps. Auxiliary wedges installed in 3 set screws with excessive gaps after modification.
	2006	VT-1	14 RIO VT-1 of all 20 Jet Pump wedges following inlet mixer labyrinth seal modification and VT-3 of modification hardware. Minor wear and movement found in several wedge rods and minor wear in two wedges. One wedge required expanded BWRVIP-41 exams due to wear. No set screw gaps or damage found. Expanded scope N2A JP01 RS6, RS7, MX-7 AS-1, AS-2. No Recordable Indications.
		EVT-1	EVT-1 of selected JP welds 2 each RS-1, RS-2, and RS-3 for second inspection cycle for High Priority welds and continued with Medium priority weld inspections for selected IN-4 4 welds, RS-8 and RS-9 welds 2 each. No Recordable Indications
		EVT-1	N2D and N2G Riser brace welds RB-1 a-d and RB-2 a-d. No Recordable Indications.
	2008	UT	15 RIO UT of all 20 Jet Pump Beams, BB-1, BB-2, and BB-3. No Recordable Indications.
		UT	UT of Jet Pump Diffuser Welds. All 20 jet pumps UT of AD-1, AD-2, DF-1, DF-2, and MX-2 welds. No Recordable Indications.
		EVT-1	EVT-1 of Jet Pump Medium and High priority welds. N2 F Riser welds RS-1, RS-1a, RS-2, and RS-3 High priority

			welds 3 each. N2D, N2E, N2G, and N2 H Riser Medium priority welds 6 each RS-6 and RS-7 welds 8 each and N2H riser RB1a-b and RB2-a-b welds. No Recordable Indications.
		VT-1	VT-1 of all 20 wedges WD-1 exams, one set screw AS-2 exam. Five jet pumps with previous wedge wear, no increase in wear noted, two jet pumps newly discovered wear this outage. Twelve jet pumps with previous wedge rod wear inspected, increase in wear noted in 4 jet pumps, newly discovered wear in one jet pump. Set screw on JP01 minor wear into bellyband. Three additional wedges showed minor rod wear.
LPCI Couplings			Not applicable to this plant
Lower Plenum Components			
CRD Guide Tubes	2002	EVT-1 and VT-3	12 RIO, inspected 4 guide tubes, CRGT-1,2,and 3 per BWRVIP-47. No Recordable Indications.
	2004	EVT-1 and VT-3	13 RIO inspected 6 guide tubes, CRGT-1,2,and 3 per BWRVIP-47. No Recordable Indications.
	2004	VT-3	13 RIO VT-3 of 40 Guide Tubes OD with GE Firefly remote inspection tool when lower plenum made available by Jet Pump mod. No Recordable Indications.
Stub Tubes	2004	VT-3	VT-3 of 40 Stub Tubes with GE Firefly remote inspection tool when lower plenum made available by Jet Pump mod.
Dry Tubes	Every other outage	VT-3	No recordable indications
	2004	VT-3	13 RIO VT-3 for gross damage only for 6 of 12 dry tubes. Remaining 6 dry tubes

			were replaced.
Instrument Penetrations	1985 to 2008	VT-2	VT-2 exams during RPV pressure test each outage. No Recordable Indications.
Vessel Brackets	to date	VT-1 and VT-3	1989 Section XI inspections of jet pump riser brace, dryer, feedwater brackets, core spray header brackets, and surveillance capsule holder brackets, performed once per interval. Unit #1 Dryer Support Block C replaced due to fatigue cracking. "Measurable but acceptable wear"
	1998	VT-3	10RIO VT-3 Examinations were performed on the dryer hold down bracket attachment welds located at 138 and 221 degrees. No Recordable Indications. VT-3 Examinations were performed on the dryer support brackets and attachment welds located at 4, 94, 184 and 274

			degrees. No new indications were observed. Previously recorded wear on support lug "D" at 274 deg. was verified and no additional wear noted.
	2000	EVT-1	11 RIO Core spray piping and sparger brackets, feedwater sparger brackets, and dryer support brackets. No Recordable Indications.
	2002	VT-3 & EVT-1	12 RIO. Core spray piping and sparger brackets examined, dryer support bracket, and surveillance sample holders. Some measurable wear on "D" dryer support bracket was noted.
	2004	VT-3 & EVT-1	13 RIO Jet pump riser support welds, Dryer support brackets, no additional wear noted on "D" dryer support bracket, guide rod bracket, dryer hold down bracket, Core spray brackets for ASME XI with No Recordable Indications.
	2006	VT-3 & EVT-1	14RIO Jet Pump riser support welds, Core Spray Bracket pad to vessel welds, guide rod bracket and surveillance specimen attachment welds. No Recordable Indications.
	2008	VT-3 & EVT-1	15RIO All four steam dryer support brackets were polished smooth and level by the EDM process to create a level surface for the new steam dryer to rest on. Minor wear on two brackets was observed. The 274 degree bracket had pronounced wear pattern prior to EDM. Post EDM all bracket seating surfaces were level with no sign of wear. All final inspections were No Recordable Indications.
Steam Dryer	2006	VT-1	14 RIO VT-1 exam of all steam dryer components per GE SIL 644 Rev. 1 and BWRVIP-139 in anticipation of EPU. Inspections included Hood Panel Welds,

			Lifting Lugs, Drain Channel Welds, Hood/End Panel Welds, Steam Dam to Hood Joint Welds, Tie Bar Welds, Vane Bundle to Vane Assembly, and all previously identified indications. Minor growth in existing minor IGSCC cracks some new IGSCC minor cracks in Drain Channel and Hood/End Panel Welds. Newly discovered Vane Bundle Assembly to Seam Dam weld 8" fatigue crack. Fatigue crack in Upper Dryer Lifting Lug Support for the 220° Lifting Lug found. Entire flaw lengths for both locations were repaired through underwater welding.
	2008	VT-1	15RIO VT-1 Baseline PSI exam of new replacement steam dryer prior to installation per BWRVIP-139. Four welds required re-work after acceptance by supplier.
Steam Separator	2008	VT-1	15RIO VT-1 of 25% of support ring to gusset welds. Minor IGSCC cracks found in 4 welds. Use-As-Is.
		VT-3	VT-3 of all tie bars. No Recordable Indications in tie bars. Nine exhaust tubes exhibited minor areas of deformation / denting all Use As-Is. VT-3 of shroud head bolt windows and pins. Minor wear observed in three bolts. Use-As-Is disposition. UT exam of 31 "old style" shroud head bolts. Two bolts contained Recordable Indications and were replaced.
Feedwater Spargers and Brackets	2008	VT-1 / VT-3	VT-1 of feedwater sparger welds and nozzles. VT-3 of brackets for OE for pin wear into bracket top. No Recordable Indications Noted.
Miscellaneous DM Welds	2008	UT	During the U1-15RIO, six (6) dissimilar metal (DM) IGSCC Category C welds and two (2) IGSCC Category E weld overlays were examined to the requirements of

			ASME Section XI, Appendix VIII, Supplement 10, using automated ultrasonic equipment. These eight (8) welds all contained Alloy 82/182 weld material. No failures were identified. Included in these eight examinations was the examination of vessel nozzle to safe end weld N2D NOZ-SE, which was added to the U1-15RIO inspection scope when review of its previous 2004 exam data (prompted by EPRI/BWRVIP Letter 2007-367 as the result of recent industry DM weld issues) identified a 'sub-surface reflector or discontinuity'. The U1-15RIO examination determined that the sub-surface flaw was from original weld manufacture and that it has not grown, nor are there any forces causing it to grow. The sub-surface flaw meets ASME Section XI Table IWB 3514-2 requirements