

BWRVIP BWR Vessel & Internals Project _____ 2003-287

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

Attention: Meena Khanna

Subject: Project No. 704 – BWR Vessel and Internals Inspection Summaries for Fall 2001 Outages

Enclosed are ten (10) copies of the document entitled “BWR Vessel and Internals Project, Vessel Internals Inspection Summaries for Fall 2001 Outages, August 2003.”

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. 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 documents. If you have any questions on the enclosed documents or the general subject of inspection results, please contact Vaughn Wagoner, BWRVIP Integration Committee Technical Chairman, Progress Energy, by telephone at 919.546.7959.

Sincerely,



Carl Terry
Chairman, BWR Vessel and Internals Project
Constellation Generation Group
Nine Mile point Nuclear Station

D058

BWR Vessel and Internals Project

**Vessel Internals Inspection Summaries
for Fall 2001 Outages**

August 2003

Table of Contents

<u>Plant</u>	<u>Page</u>
1. Dresden Unit 2	3
2. Fermi 2	10
3. Hatch Unit 2	19
4. Hope Creek	25
5. Monticello	31
6. Peach Bottom Atomic Power Station, Unit 3	43

Reactor Internals Inspection History

Plant: Dresden Unit 2

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	8/95	EVT-1 and UT	<p>Inspections per BWRVIP Guidelines of all shroud repair design reliant structures prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspection of shroud consisted of EVT-1 of all ring segment welds (accessible surfaces), EVT-1 of between 43% and 72% of the length of each vertical weld between H1 & H2 from OD surface (ID not accessible), UT of between 30% and 50% of the length of each of the 6 beltline vertical welds, EVT-1 of between 43% and 72% of the length of 2 of the 3 vertical welds between H6 & H7 from OD surface (ID not accessible), and UT of 35% of the length of the remaining vertical weld between H6 and H7.</p> <p>No Reportable Indications.</p>
	3/98 D2R15	Visual	<p>Shroud repair hardware inspected per GE recommendations. NRI.</p>
	10/1999 D2R16	UT & EC	<p><u>Core Shroud Examination Summary</u> ComEd performed examinations on the core shroud vertical welds V14/ V15/ V16/ V17/ V18/, and V19 per the requirements of BWRVIP-76 for a repaired shroud. The core shroud was examined in the following areas.</p> <ul style="list-style-type: none"> • Weld V14/V15/V16/V17/V18/V19 UT & EC examination from the ID with the TEIDE 2 manipulator. <p>Coverages Weld V14: 80.1%</p>

	10/2001 D2R17	EVT-1	<p>Weld V15: 80.1%</p> <p>Weld V16: 83.4%</p> <p>Weld V17: 52.6%</p> <p>Weld V18: 62.8%</p> <p>Weld V19: 58.0%</p> <ul style="list-style-type: none"> • No recordable indications were found <p>Exelon performed one sided EVT-1 of all vertical welds outside of the beltline with 100% coverage including welds V5, V6, V7, V226, V27 and V28. There were no recordable indications.</p>
Shroud Support	8/95	EVT-1	EVT-1 of H8 and H9 for approx 12" at 4 locations of shroud repair hardware attachment areas.
	3/93	UT/VT-1	Access hole cover proactively replaced with GE mechanical design. UT for radial flaws performed prior to replacement. No indications identified.
	8/95	VT-1	VT-1 of both replacement access hole cover assemblies. No indications identified.
	3/98		Not Inspected during D2R15
	10/1999 D2R16	EVT-1	Core Support Structures, Performed EVT-1 of H8 and H9 Welds per BWRVIP-38 requirements. No Recordable Indications
Core Spray Piping D 2	1980s to D2R14	VT-1 / UT (1MIL)	IEB 80-13 (1 MIL) VT-1 of piping and welds in annulus. Indications observed at one lower elbow to riser weld (3P4c) and two collar to shroud pipe welds (3 and 4P8a) in 1995. All flaw lengths verified with UT. Full structural margins met on all three flawed welds for additional cycle. No repairs performed.
	3/98	Auto UT, 0.0005"	GE CSI-2000 Inspected with EVT-1 supplement for unqualified welds (P8a

		EVT	and P4d). Identified three previously unidentified flaws (1P5, 2P8a and 3P4d) for a total of six flaws. All flaws were analyzed for two additional cycles of operation with no repairs required. Previously identified flaws were determined to be of the same or less extent than originally sized. 1P5 and 2P8a were not visually verified.
	10/2000 D2R16	EVT-1	Core Spray Piping: P8a and P4d, EVT-1 @ all four locations. Previous indications have been found on the Core Spray Elbow to Collar on the 260° Downcomer. The results of the 1999 measurements compared with the two previous 1998 indications are as follows. It appears that the Collar indication has not changed, while the indication on the elbow is larger this year than was seen in 1998. The noted crack growth was bounded by the previous flaw evaluation and the BWRVIP-18 crack growth value.
	10/2001 D2R17	Auto UT and EVT-1	GE CSI-2000 inspected a complete Target Set and a sample of P4 welds. No new flaws. Growth within Fracture Mechanics Evaluation predictions. Performed EVT-1 of undemonstrated welds.
Core Spray Sparger	1980s to present	VT-1 (1 MIL)	IEB 80-13 (1 MIL) VT-1 of spargers and tee-boxes. No indications found. Future inspections per BWRVIP-18.
	3/98	EVT-1 MVT-1	End caps, cover plates and tee box branch welds were EVT-1 examined (OD). All sparger connections and bracket welds were MVT-1 examined. NRI.
	10/2001 D2R17	EVT-1 and VT-1	Complete Target Set and 50% of S3 welds. No Indications recorded.

	01/2000 D2R16	EVT-1, UT	<p>elbow HAZ at RS-1. Evaluated for two cycles of operation without repair. NRI all others.</p> <p>Jet Pump Beams, UT 100% of Beams NRI</p> <p>Riser Brace, Restrainer Bracket, Wedges and Inlet Mixers EVT-1 High/Medium Priority Welds Per BWRVIP-41 sample and inspection requirements. Minor Indications noted.</p>
	10/2001 D2R17	UT EVT-1	<p>Jet Pump Beams, UT 100%, NRI</p> <p>Riser Brace Leaf at RPV wall block on JP#9, upper Rb 4 weld cracked. EVT-1 examined 100% scope expansion, no other indications. Checked and found no set screw gaps. Examined for B-N-2.</p> <p>Measured known RS-1 crack on riser 15/16. No change in last two cycles. No other BWRVIP-41 scope</p>
Jet Pump Diffuser	8/95	VT-1	<p>Diffuser to baffle plate welds on all 20 jet pumps. No indications.</p>
	3/98		<p>Not inspected D2R 15.</p>
	01/2000 D2R16	EVT-1	<p>JP Diffuser EVT-1 High/Med Priority welds per BWRVIP-41 sample and inspection requirements. NRI</p>
	10/2001 D2R17	EVT-1	<p>No scope D2R17.</p>
CRD Guide Tube	8/95	VT-1 (1 MIL)	<p>11 CRD guide tube lower assembly welds, 2 CRD guide tube upper assembly welds, 4 CRD guide tube alignment ear welds.</p> <p>No indications identified.</p>
	3/98		<p>Not inspected D2R 15.</p>
	01/2000 D2R16		<p>Not inspected D2R 16</p>

	10/2001 D2R17	EVT-1 and VT-3	5% inspected (9) per BWRVIP-47, CRDGT-1,2,3 and pin No indications.
CRD Stub Tube D 2	8/95	VT-1 (1 MIL)	14 CRD housing to CRD stub tube welds, 14 CRD stub tube to RPV bottom head welds, 3 CRD housing tube to housing cap welds. No indications identified
	3/98		Stub tubes not inspected D2R15.
	01/2000 D2R16 10/2001 D2R17		Stub Tubes not inspected D2R16 Stub Tubes not inspected D2R17
In-Core Housing	8/95	VT-1 (1 MIL)	4 incore guide tube to housing welds, 4 incore housing to RPV bottom head welds, 4 incore guide tube stabilizers. No indications identified
	3/98		Not inspected D2R 15.
Dry Tube	8/95	VT-1	No indications identified. Examined every other outage.
	3/98		Not examined D2R 15.
	10/2000	VT-1	No indications identified
Instrument Penetrations	N/A	N/A	N/A
Vessel ID Brackets	4/94	VT-1	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. No indications noted.
	3/98	MVT-1	Inspected Core Spray Brackets per BWRVIP recommendations. NRI.
	10/2000 D2R17	VT-1 VT-3	All six sets of surveillance capsule brackets. NRI. Guide Rod Attachments, all six lugs. NRI

		EVT-1	Four Dryer lugs, EVT-1, NRI.
LPCI Coupling	N/A	N/A	Not applicable to this plant.

Reactor Internals Inspection History

Plant: Fermi 2

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud (BWRVIP-07/76)	RF-04 (7/94)	VT-1 (1mil wire)	Inspected: 100% ID welds H2, H3, and H4; 100% OD welds H1-H7; accessible areas H8 & H9
		VT-1/VT-3	The only indications identified were two <1" vertical in orientation above the H2 weld at azimuth 125 degrees. These were evaluated against established flaw screening criteria and found acceptable.
	RF-05 (9/96)	EVT-1 (1/2mil wire)	Inspected approximately 60-70 degrees arc on the core shroud in area of previous indications. H2-H4 inspected on shroud ID, H1-H7 inspected on shroud OD. No new indications, no change observed in previous indications above H2 weld.
	RF-06 (9/98)	UT	Performed focused phased array UT examination of the H3, H4, H5 and H7 welds utilizing GE's universal carousel. No indication of cracking was identified.
		EVT-1	A cursory exam was performed on H-3 weld to confirm UT results for information only. No new indications and no change was observed in the previous indications above H2 weld.
	RF-07 (4/00)	EVT-1	Reinspected the indication above the H2 weld on the inside of the shroud. No change in appearance. The control rod blade was withdrawn to perform the examination.
RF-08 (11/01)	EVT-1	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support	

Shroud Support (BWRVIP-38)	RF-03	VT-3	Inspected shroud support gusset welds and H8/H9 in conjunction with jet pump inspections. No indications
	RF-04 (7/94)	VT-1/VT-3	Inspected areas in conjunction with jet pumps, included were gusset welds H8 and H9. H8 and H9 welds inspected at 0 and 180 degrees with 1 mil wire. No indications.
	RF-05	EVT-1 (1/2 mil)	Inspected sample area 60-70 degree arc plus 180 degrees location on H8, H9, and gussets. No indications.
	RF-06	VT-3*	Inspection performed in conjunction with jet pump inspections. Approximately 50% of the gussets and H8 and H9 welds were inspected. This was a best effort exam which ranged from MVT-1 to VT-3 depending on camera angle and lighting. No cleaning was performed. No indications identified.
	RF-07	EVT-1*	Inspection performed in conjunction with jet pump inspections. Remaining 50% of the gusset welds were inspected. This was a best effort exam which ranged from EVT-1 to VT-3 depending on camera angle and lighting. No cleaning was performed. No indications identified. The H8 and H9 welds were inspected in detail at 0 and 180 Deg. Azimuth to EVT-1 standards where there were no obstructions.
	RF-08	EVT-1	The H8 and H9 welds were reinspected to achieve required coverage. 22% of both welds were inspected and included the areas at 0 and 180 degrees as well as adjacent to Jet Pumps 2 and 3. Accessible areas on Gussets 1,3,11,12, and 22 were inspected
Core Spray Piping (BWRVIP-18)	each outage RF-01 --	VT-1 (1mil)	During RF-01 two small arc strikes were identified on loop piping. These have

	RF04		been reinspected each outage. No change in condition . Inspections performed per IEB 80-013 and SIL 289. No indication of cracking.
	RF-05	EVT-1 (1/2mil) VT-1	All welds brushed prior to inspection using 1/2 mil wire. Remainder of loop piping inspected without brushing. No indication of cracking.
	RF-06	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards as opposed to BWRVIP-18 requirements of MVT-1. Cleaning assessment was performed – cleaning was not necessary. No indication of cracking.
	RF-07	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards. Cleaning assessment was performed – cleaning was not necessary. No indication of cracking.
	RF-08	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards. Cleaning assessment was performed, cleaning was not necessary. No indication of cracking.
Core Spray Sparger (BWRVIP-18)	each outage RF01-RF04	VT-1 (1 mil)	During RF01 one arc strike identified on upper CS sparger. Reinspections have not identified any changes. No indication of cracking
	RF-05	VT-1 EVT- 1 (1/2mil)	1/2 mil wire used for junction box remainder utilized 1mil wire. No indication of cracking.
	RF-06	EVT-1, MVT-1	Inspected per BWRVIP-18 using EVT-1 for sparger T-box and end caps and MVT-1 for remaining locations. No indications of cracking.
	RF-07	EVT-1/VT- 1	Inspected per BWRVIP-18 using EVT-1 for sparger T-box welds, end cap welds, drain plug welds, and support brackets and welds, and VT-1 for flow nozzles

	RF-08	EVT-1/VT-1	and tack welds. No indications of cracking identified. Inspected per BWRVIP-18 using EVT-1 for S1, S2 and S4 welds. Selected S3a, S3b welds inspected using VT-1. Selected S3c welds as well as selected SB bracket welds were inspected using EVT-1 technique. A best effort exam was performed on all accessible areas. No indications of cracking identified.
Top Guide (Rim, etc.) Beams (BWRVIP-26)	Each outage	VT-3	Inspected rim each outage. No indications.
	RF-03	VT-1	6 locations (RICSIL 059). No indications.
	RF-04	VT-1	6 locations (SIL 554). No indications.
	RF-05	VT-1	15 locations (SIL 554). No indications.
	RF-06	VT-1	Inspected bottom edge of beams at 11 core locations per SIL 554. No indication of cracking.
	RF-07	VT-1	Inspected bottom edge of beams at 8 core locations per SIL 554. No indication of cracking.
	RF-08	VT-1	Inspected bottom edge of beams at 5 core locations per SIL 554. No indication of cracking.
Core Plate (Rim, etc.) (BWRVIP-25)	RF-05	VT-1 (1mil wire)	Inspected 6 core plate bolts located between 100 and 160 degrees and adjacent area. No indications.
	RF-06	VT-3	Inspected tops of approximately 20 bolts.
	RF-07	VT-3	Inspected tops of approximately 20 bolts.
	RF-08	VT-3	Inspected tops of approximately 20 core plate bolts (VT-3) per SIL 588. Did not meet BWRVIP requirements.
SLC	RF-04	VT-3	Performed a visual inspection from

(BWRVIP-27)	RF-05-07	N/A	<p>Reactor penetration to shroud support when access was provided during jet pump beam replacement. No indications.</p> <p>No inspections performed as access was not provided.</p>
	RF-08	VT-2	<p>Performed enhanced inspection on nozzle area from inside skirt area, but did not remove mirror insulation box from safe-end.</p>
Jet Pump Assembly (BWRVIP-41)	Each outage examine at least 50%	VT-1 VT-3	<p>Jet pump assemblies are inspected each outage from top to bottom. During RF-04 all (20) hold down beams were replaced as a preventative measure and to avoid performing UT's on the old style/original beams. Inspection are performed to the recommendations of SIL 551, 574, 465 S-1, and RICSIL 078. During RF05 one of the 80 restrainer screw tack welds was found to be cracked. This is the only indication found to date. This was evaluated and was not repaired during RF-05</p>
	RF-06	MVT-1, VT-3	<p>Performed inspections to the intent of BWRVIP-41 as well as augmented VT-3 of selected areas on jet pumps 1-10. Inspections included all High, Medium and Low Priority locations. Inspected RS-1 and RS-2 welds on jet pumps 11-20. One indication identified on RS-1 weld, 1.75" long. JCO performed prior to start-up.</p>
	RF-07	EVT-1	<p>Performed inspections to the intent of BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected areas on jet pumps 11-20. Inspections included all High, Medium and Low Priority locations. Reinspected previously identified indication on RS-1 weld, 1.75" long that was identified in RF-06. No change in indication length or appearance. Existing Flaw Evaluation on</p>

	RF-08	EVT-1	<p>hand prepared by GE referenced as acceptance limit.</p> <p>Performed reinspections to the intent of BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected areas on jet pumps 1& 2. Inspections included all High, Medium and Low Priority locations. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7&8 that was identified in RF-06. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 jet pumps per recommendations of SIL 629 and verified no wedge damage (WD-1) as well as full contact with restrainer screws. No damage identified on any location. Reinspected all restrainer screw tack welds with no change observed.</p>
Jet Pump Diffuser (BWRVIP-41)	Each outage as above	VT-3	This will be inspected during each refueling outage. Same as above
	RF-06	MVT-1	BWRVIP-41 on jet pumps 1-10 except inaccessible areas. No cracking.
	RF-07	EVT-1	BWRVIP-41 on jet pumps 11-20 except inaccessible areas. No cracking identified. Welds DF-3, AD-1, and AD-2 are inaccessible for inspection.
	RF-08	EVT-1	BWRVIP-41 reinspection on jet pumps 1 and 2 except inaccessible areas. No cracking identified. Welds DF-3, AD-1, and AD-2 are inaccessible for inspection.
CRD Guide Tube (BWRVIP-47)	RF-04	VT-3	Inspected lower portion of peripheral guide tubes and stub tubes when access was provided during jet pump hold down beam replacement.
	RF-07	EVT-1 and VT-3	Performed best effort exam on CRGT-3 as weld was not visible on inside of tube,

	RF-08	EVT-1 and VT-3	CRGT-2 not accessible due to flow and ARPIN was not felt to be accessible. Performed best effort exam on CRGT-3 as weld was not visible on inside of tube, CRGT-2 not accessible due to flow and FS/GT-ARPIN was not felt to be accessible.
CRD Stub Tube * (BWRVIP-47)	RF-04	VT-3	same as above
In-Core Housing * (BWRVIP-47)	RF-04	VT-3	Small portion visible during jet pump beam replacement. No indication of degradation.
Dry Tube * (BWRVIP-47)	Each outage	VT-1	9 tubes found not completely seated. Performed all inspections per SIL 409 and RICSIL 073. No indications of cracking
	RF-06	VT-1	No change from previous condition. No cracking.
	RF-07	VT-1	Inspected all 12 original design Dry Tubes. No change from previous conditions identified. No cracking identified.
	RF-08	VT-1	Inspected all 12 original design Dry Tubes from two sides. No change from previous conditions identified. No cracking identified.
Instrument Penetrations* (BWRVIP-49 & 41))	Each outage	VT-3	Inspected jet pump sensing lines and brackets each outage.
	RF-04	VT-3	SLC and peripheral bottom head penetrations inspected. No indications.
	RF-06	VT-3	Inspected JP sensing lines for pumps 1-10. No indications.
	RF-07	VT-3	Inspected JP sensing lines for pumps 11 thru 20 only. No indications.
	RF-08	VT-3	Inspected JP sensing lines for pumps

			1&2 only. No indications.
Vessel ID Brackets (BWRVIP-48)	Each outage	VT-1/3	Inspect sample population each outage. We have inspected most brackets each outage (core spray, feedwater). Jet pump riser brace, steam dryer support lugs, guide rod brackets and specimen holder brackets are sample inspected.
	RF-06	MVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket 1 specimen bracket. No indication of cracking.
	RF-07	EVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket No indication of cracking identified.
	RF-08	EVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket Surveillance holder and Brackets@ 30 az. No indication of cracking identified.
LPCI Coupling	N/A	N/A	Do not have a LPCI Coupling
Shroud Head Bolts	RF-04	UT/VT	16 had indications, 17 replaced during RF-04. Remaining bolts replaced (31) during RF-05 as a preventative measure. All 48 are now new style.
	RF-06	VT-3	Bolts 1-24 (of 48). No indication of cracking.
	RF-07	VT-3	Bolts 25-48 (of 48). No indication of cracking or damage. Springs were left compressed on 20 of the 24 inspected.
	RF-08	VT-3	Bolts 1-24 (of 48). No indication of cracking or damage

***VT-2 leakage inspections have been and are performed on all RPV Instrumentation Nozzles and Piping Nozzles each refuel outage. An enhanced leakage inspection is performed on all locations to ensure no pressure boundary leakage. Inspections are performed in the annulus area adjacent to the vessel skirt, and are performed under vessel to ensure that any leakage identified is not from welded connections. Flange leakage from CRDM's is recorded, evaluated, and repaired if necessary.**

**Outage: RF-01: Fall of 1989
 RF-02: Spring of 1991
 RF-03: 9-21-92 10-31-92 Inspection sign on/off dates
 RF-04: 5-10-94 09-21-94 Inspection sign on/off dates
 RF-05: 9-30-96 11-04-96 Inspection sign on/off dates
 RF-06: 9-08-98 10-08-98 Inspection sign on/off dates
 RF-07: 4-03-00 05-04-00 Inspection sign on/off dates
 RF-08: 10-15-01 11-20-01 Inspection sign on/off dates**

Reactor Internals Inspection History

Plant: Hatch 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 Horizontal Welds	1994	UT VT-1 (.001)	UT H-1 through H-4. Indications on all four (4) welds. Safe for continued operation. VT-1 (.001) with brushing on sample areas of H-5, H-6A(B), & H-7) at 190° and 350°. No indications. Installed four (4) Shroud Tie Rods in "95" which exempts horizontal welds H-1 through H-8 from inspection.
Core Shroud Tie Rods	1995	VT-3	Installed four (4) Shroud Tie Rods '95. Performed baseline. No indications.
	1997	VT-3 & Tightness	Performed first cycle inspections on all 4 Shroud Tie Rods. No indications.
	1998	VT-3 & Tightness	Shroud Tie Rod at 225°. No indications. Future Shroud Tie Rod Inspections not to exceed 10 years.
Core Shroud Vertical Welds	1995	EVT-1	Bottom ID/OD six (6) inches of V-3, V-4. Top ID/OD six (6) inches of V-3, V-4. Top ID/OD twenty-four (24) inches of V-5 & V-6. No indications. Inspections to support the Shroud Tie Rod installation.
	1997	EVT-1	Performed baseline all verticals from the outside surface per BWRVIP-07. No indications.
	2000	EVT-1	Performed baseline all verticals in the beltline region (V-3 through V-8) from the inside surface. No indications. V-1

	2001	EVT-1	& V-2 are inaccessible for visual inspection from the inside surface, and very limited from the outside surface for volumetric examination. Performed EVT-1 examinations from the outside surface for welds V-1, V-2, V-9, V-10 and V-11. No reportable indications. These welds are scheduled in approximately six year intervals for single sided coverage per BWRVIP-63
Core Shroud Ring Segment Welds	N/A	N/A	Hatch 2 does not have Ring Segment Welds.
Core Shroud Support	1995	EVT-1	<u>Horizontal surfaces of Shroud Support Ledge</u> : Examined four (4) locations (45°, 135°, 225°, & 315°) between Jet Pumps on top surface adjacent to locations where Shroud Tie Rods to be installed. No indications.
	1997	VT-3	<u>H-9</u> : Examined 25% of accessible top surfaces. No indications.
	1998	VT-3	<u>H-9</u> : Examined 75% of accessible surfaces from top per BWRVIP-38. No indications
Core Spray Internal Piping	1980-97	VT-1 (.001)	IEB 80-13/NUREG CR-4523. Examined 100% each outage prior to '96. No indications.
	1997	EVT-1	Baseline per BWRVIP-18. No Indications.
	1998	EVT-1	Re-Inspection BWRVIP-18. No Indications.
	2000	EVT-1	Re-Inspection BWRVIP-18. No Indications.
	2001	EVT-1	Re-Inspection BWRVIP-18. No indications
Core Spray Sparger	1980-96	VT-1 (.001)	IEB 80-13/NUREG CR-4523. Examined 100% each outage prior to '97.

	1997	CSV-1	Indications reported in four (4) Sparger Bracket to shroud welds first reported in 1994, safe for continued operation. Indications reported on four more Sparger Bracket to shroud welds in 1995. Eight (8) locations total. Safe for continued operation.
	1998	CSV-1 VT-3 (1/32)	Examined all previously reported Sparger Bracket indications. No change.
	2000	EVT-1 VT-1	Re-inspection per BWRVIP-18. No change in previously reported Sparger Brackets indications from 1994/1995. Can not clean or get a good close look at these indications to classify.
	2001	EVT-1 VT-1	Began sampling Sparger inspections as "Geometry Critical" instead of "Geometry Tolerant." No new indications. No change in previously reported eight (8) Sparger Brackets indications from 1994/1995. Can not clean or get a good close look at these indications to classify.
Top Guide BWRVIP-26, 1997, Top guide has wedges.	1992	VT-1 (.001)	No new indications. No change in previously reported eight (8) Sparger Brackets indications since 1994/1995. Can not clean or get a good close look at these indications to classify.
	1994	VT-1 (.001)	<u>Grid/beams</u> : SIL-554, VT-1 (.001) bottom of intersections. Examined 28 cells in '92. No indications.
	1995	VT-3	<u>Grid/beams</u> : SIL-554, VT-1 (.001) bottom of intersections. Examined 10 cells in '94. No indications. <u>Hold downs & aligners</u> : SIL-588, examined 2 of 4 1994. No indications.
	1997	VT-1 (.001)	<u>Wedges (24)</u> : No indications.
			<u>Grid/beams</u> : SIL-554, VT-1 (.001) bottom of intersections. Examined 6

	2001	VT-1/3 VT-1	<p>cells in '97. No indications. <u>Rim, upper/lower plates, bolting:</u> Examined in 1997. No indications.</p> <p><u>Hold-downs</u> and attachments to the shroud (2 of 4) 180 apart every other outage. No relevant indications. The previous analysis was no longer valid since power and extended power up-rate.</p>
Core Plate	1994 1995	VT-3	<p><u>Surfaces:</u> Examined accessible areas during CRB replacement. No indications. <u>Hold down bolts:</u> No indications.</p> <p>No BWRVIP inspections are required. Core Plate wedges installed in 1995.</p>
Standby Liquid Control	1980-96 2000 and 2001	VT-2 Direct VT-2	<p>Not accessible from inside. Portion visible during '94 access hole cover replacement. Examined for leakage from outside during RPV leakage test each outage. No indications</p> <p><u>Safe-end & Extension :</u> RPV Support Skirt was found to have an inspection cover to gain access during leakage test. No Leakage. Looking at performing UT in the future.</p>
Jet Pump Assembly	1980-1988 1994 1995 1997	UT VT-1/3 VT-1/3 VT-1 (.001) & VT-3	<p><u>Hold down beams:</u> UT each outage in '80 - '88 outages - indications in 1 beam, replaced with original design. Replaced all beams in '89 with improved design.</p> <p><u>1994:</u> Riser Brace Pads & Arms, Restrainers. No Indications</p> <p><u>1995:</u> All adjusting screw tack welds, sensing lines & support brackets, pads & arms. No Indications.</p> <p><u>4 assemblies:</u> (riser brace pad, restrainer adjusting screw tack welds, riser brace arm tack welds, inlet mixer, sensing line, restrainer set screw gaps). No indications.</p>

	1998	MVT-1	<p><u>Hold down beams:</u> All 20 Hold down beams examined in '98 per BWRVIP-41. No indications.</p> <p><u>Thermal Sleeve to Elbow Welds:</u> All 10. No indications.</p> <p><u>All High Priority Welds</u> (not TS to el.): per BWRVIP-41. Two small indications reported on one (1) RS-3 & one (1) DF-1 weld. Possibly non-relevant. Disposition acceptable, examine next outage.</p>
	2000	EVT-1	<p>Re-examination of two (2) previous indications reported in 1998, one (1) RS-3 & one (1) DF-1 weld. Indications determined to be non-relevant.</p>
	2001	VT-1 & EVT-1	<p>50% of the medium priority welds per BWRVIP-41. RS-6 to RS-7s, RS-8 to RS-9s, RB-1s, RB-2s, MX-1s, WD-1s, DF-1s. No relevant indications.</p>
CRD Stub Tubes	1994	VT-3	<p>Examine when accessible once/interval. Not normally accessible from inside. Portions visible during '94 access hole cover replacement - no indications. Examined 14 in '94. No indications.</p>
Guide Tubes	1994	VT-3	<p>Examine when accessible once/interval. Not normally accessible from inside. Portions visible during '94 access hole cover replacement - no indications. Examined 14 in '94. No indications.</p>
	2001	EVT-1 & VT-1	<p><u>Guide Tube Welds:</u> Examined CRGT-1, -2 & -3 in 14 guide tubes with Anti-Rotation Pins. (14% of the population) per BWRVIP-47. No relevant indications. Future inspections based on industry inspection results. Also examined 14 Anti-Rotation Pins.</p>
Instrument Penetrations	1980-2001	VT-2	<p>2N11, 2N12, 2N16 Nozzles. Examined during RPV leakage test each outage. No</p>

			indications. Hatch ASME exempt.
<p>*RPV Interior Attachments (BWRVIP-48)</p> <p>*Other Attachments examined by other BWRVIP documents.</p>	1989	VT-1, VT-3	<u>Feedwater sparger brackets:</u> NUREG-0619, Examine every fourth outage. Examined in '89, '92 & '97. Mechanical damage on 1 bracket in '83 - bracket replaced. No new indications.
	1992	VT-1, VT-3	<p><u>Guide rod brackets:</u> Examine once/interval. Examined in '92. Mechanical damage on 1 bracket in '92 - safe for continued operation.</p> <p><u>Steam dryer hold down brackets:</u> Examine once/interval. Examined in '92. No indications.</p> <p><u>Steam dryer support brackets:</u> Examine once/interval. Examined in '92, '94 & '97. Raised metal indications on 2 brackets in '92 - metal removed, safe for continued operation.</p> <p><u>Surveillance specimen brackets:</u> Examine once/interval. Examined in '92, '97 & '98. No indications. BWRVIP-48 in '98.</p>
	2001	EVT-1 VT-1	<p><u>Feedwater sparger brackets:</u> 50% of the brackets. No relevant indications. Once/10 years.</p> <p><u>Surveillance specimen brackets:</u> 1 of the 3 brackets. No relevant indications. Once/10 years.</p>
LPCI Coupling (BWRVIP-42)	Not Applicable to Hatch	N/A	N/A

Reactor Internals Inspection History

Plant: Hope Creek

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	WINTER - 96	VT-1 (1-MIL)	Examined H-4, H-5 @ 4 cell location. No indications found IAW SIL 572 R1 BWRVIP CAT B exam sched for fall of 97
	Fall -97	UT	Examined 100% accessible regions of H-3,4,5,7
	March 99		No examination
	April 2000		No examination
	October 2001		No examination
Shroud Support	once a period on the annulus side of the shroud 88-97	VT-3	Examined 6 shroud support pillar during spring 94 IAW Sec. XI. No indications found
	Fall - 97	VT1/VT3	examined accessible portions of H-8 and H-9
	March 99	VT1/VT3	examined accessible portions of H-8 and H-9
	April 2000		no examination
	October 2001		No examination
Core Spray Piping	88 to Present, examine once per period (at least every other outage)	VT-1 (1-mil)	Piping and welds in annulus examined IAW IEB 80-13. One indication found on a bracket bolt tack weld bracket was found not to be cracked during winter 97
	Fall 97	EVT -1 .0005 mil	examined all creviced weld location between thermal sleeve and shroud no indications noted

	March 99	EVT -1 .0005 mil	Examined all creviced weld location between thermal sleeve and shroud no indications noted
	April 2000	EVT -1 .0005 mil	Examined all creviced weld location between thermal sleeve and shroud no indications noted
	October 2001	EVT -1 .0005 mil	Examined all creviced weld location between thermal sleeve and shroud no indications noted
Core Spray Sparger	88 to present. examine once per period	VT-1 (1- mil)	Piping and spargers in shroud examined IAW IEB 80-13. No indications found
	Fall 97		No examination performed
	March 99	EVT -1 .0005 mil	No indications noted
	April 2000		No examination performed
	October 2001	EVT -1 .0005 mil	No indications noted
Top Guide (Rim, etc.)	88 to present. examine once per period.	VT-3	Top guide examined IAW Sec. XI. No indication found
	Fall 92/ Spring 94/ Winter 96	VT-1	Examined IAW SIL 554. Examined 4 cell locations made available during normal refuel. No indication found.
top guide lateral supports	Winter 96	VT-3	Examined Top Guide wedges IAW SIL 588 R1. No Indication found.
	Fall 97	VT-3	Examined Top Guide wedges IAW SIL 588 R1. No Indication found. Examined IAW SIL 554. Examined 4

	March 99	VT-3	cell locations made available during normal refuel. No indication found Examined 4 c-clamps no indications noted
	April 2000		No examination performed
	October 2001		No examination performed
Core Plate (Rim, etc.)	None performed to date. Examination to be performed during RF07-Fall 97	VT-3	Examine core plate bolting IAW SIL 588R1
	Fall-97	VT-3	Examined all core plate hold down bolts No indications found
	March 99	VT-3	Examined 26
	April 2000		No examination performed
	October 2001		No examination performed
Jet Pump Assembly ----- jet pump riser braces	88 to present Examine once per period.	VT-3	Examined IAW Sec XI. No indication found.
	50% every other outage. Spring 94/ Winter 96/winter 97	VT-1	Examined IAW SIL 551. No indications found.
	March 99	EVT-1	Examined 50% riser braces
	April 2000	EVT-1	Examined 50% riser braces
	October 2001	VT-1	No examinations performed

jet pump hold down beams	Hold down beams were replaced during RF05- Spring 95 winter 97	VT-3	Examined IAW SIL 330. No indications found.
	March 99	VT-3	No indications noted
	October 2001		No examinations performed
jet pump sensing lines	88 to present. Examine once per period.	VT-1	Examined IAW SIL 420. No indications found.
	Winter 97	VT-1	Jet pump 8.9.15 had cracked standoffs
	March 99	VT-1	No indications noted
	April 00	VT-1	No indications noted
	October 2001	VT-1	No indications noted
jet pump adjusting screws	inspected every other refuleing outage since Oct. 93	VT-3	Examined IAW SIL 574. 94- 3 screws with 1 tack cracked 96- 4 screws with 1 tack cracked 96- 2 screws with 2 tacks cracked 97- 1 screw with 1 tack cracked
	March 99	VT-3	No additional indications noted
	April 00	EVT-1 (1-MIL)	No additional indications noted
	October 2001		No examination performed

jet pump riser pipe cracking	March 99		Examined IAW SIL 605. No indications noted
	October 2001		No examination performed
Jet Pump Diffuser			see jet pump assembly
CRD Guide Tube	Winter 96	VT-3	Examined 6 guide tubes IAW Sec. XI. No indications found.
	March 99	VT-3/1	Examined 3 guide tubes IAW BWRVIP
	April 2000		No examination
	October 2001		No examination
CRD Stub Tube	Spring 94	VT-3	Examined IAW Sec XI. Examined CRD Housing through removed jet pump diffuser. No indications found.
In-Core Housing	Not yet examined	VT-3	
Dry Tube	Examined during fall 92	VT-1	Examined IAW SIL 409. No indications found.
	March 99	EVT-1	All 12 dry tubes had circumferential cracking approx 1 inch below the upper collar
	April 2000		Replaced all 12 dry tubes
Instrument Penetrations	examined during winter 97	VT-1 and VT-3	Examine IAW Sec. XI No indication noted

Vessel ID Brackets		VT-1 and VT-3	Examine IAW Sec. XI Component brackets are examined with the component no indications found
Guide rod bracket	March 99	VT-3	No indications noted
Core spray header bracket	March 99	VT-1	No indications noted
Feedwater sparger brackets	March 99	VT-1	No indications noted
Surveillance Sample bracket	March 99	VT-1	No indications noted
Steam dryer support brackets	March 99	VT-1	No indications noted
LPCI Coupling	88 to present. Examined once per period	VT-1 VT-3	Examine IAW Sec XI
	winter 97		no indications noted
	March 99	VT-3	no indications noted
	October 2001	EVT-1 VT-1	no indications noted
N17a&b			

Reactor Internals Inspection History

Plant: Monticello

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1994-1996	UT and VT-1	<p>Baseline per BWRVIP-01 and reinspected per BWRVIP-07. Indications in several circumferential welds as identified below:</p> <p>H1 17% flawed over 307.6" total scan length.</p> <p>H2 1% flawed over 287.7" total scan length.</p> <p>H3 28% flawed over 263" total scan length.</p> <p>H4 6% flawed over 289.1" total scan length.</p> <p>H5 0% flawed over 298.4" total scan length.</p> <p>H6 4.5% flawed over 298.4" total scan length.</p> <p>H7 0% flawed over 291.7" total scan length.</p> <p>Note: 1. All flaws identified were less than 1/2 T deep. 2. Scan coverage for each weld was greater than 50%. 3. Differences in inspection methodology did not permit a rigorous correlation of the 1994 and 1996 data. 4. Full structural margins exist on all welds.</p> <p>VT-1 of accessible vertical welds & ring segment welds. Minor indication identified on ring segment weld @ 73 deg azimuth between H5 and H6. Visually examined 2 feet of the following vertical welds; V3, V4, V5, and V6. Minor indications were observed on V3 and V6.</p>
Shroud Support	1994-1996	VT-1 &	VT of H8 and H9 from the annulus have

		VT-3	<p>been performed. No reportable indications to date.</p> <p>VT of access hole covers, performed every other outage per the IVVI program. No indications have been reported to date.</p> <p>In 1984, two CRD guide tubes were removed which allowed access below the core plate. A VT-3 inspection was performed on the shroud support legs. No problems were observed.</p> <p>Note: Monticello has an oval shaped access hole cover. This design is superior to the round design in that it provides more shroud support plate material between the access hole cover welds and the vessel wall.</p>
	2000	EVT-1	Core Plate Support Ring at 65°, 185°, and 305°
		EVT-1	H8 and H9 Welds at Manway Cover Areas
		VT-1	Access Hole Cover Plate Welds at 0° and 180°
		VT-3	<p>Shroud Support Legs (14)</p> <ul style="list-style-type: none"> Crack indication in the 210° shroud support leg to shroud support cylinder weld. The majority of the indication appears to be contained within the weld material, with the lower tip extending into the shroud support leg base material.
	2001	VT-3	Re-inspection of the 210 degree location of the shroud support leg. No change in condition.
		EVT-1	Core Plate support ring at 65, 185, and 305 degrees. No indications.
		VT-1	

			Access hole cover plate welds at 0 and 180 degrees. No reportable indications.
Core Spray Piping	1980's to 1996	VT-1	IEB 80-13 of piping and welds in annulus. No indications reported visually. UT of slip joint welds per BWRVIP-18 in 1996 identified one indication on the ID of the B core spray pipe. Note: Although the flaw was not through-wall, the evaluation conservatively treated the flaw as through wall. As a result, the evaluation determined that the operability of the core spray system was not impaired. Therefore no repair is scheduled at this time.
	1998	UT	UT of the following welds in 1998 were performed per the BWRVIP-18 guidelines: <u>13.5 deg location</u> P4A, 42% coverage P4B, 43% coverage P5, 100% coverage P6, 100% coverage P7, 64% coverage P4D, 54% coverage <u>166.5 deg location</u> P4A, 41% coverage P4B, 72% coverage <u>193.5 deg location</u> P4A, 26% coverage P4B, 43% coverage <u>346.5 deg location</u> P4A, 44% coverage P4B, 62% coverage

			<p>Flaws identified during the 1998 RFO inspection were all located at the 13.5 deg location and are listed as follows:</p> <table border="1"> <thead> <tr> <th>Weld/</th> <th colspan="2">Start Location</th> <th></th> </tr> <tr> <th>Flaw #</th> <th>Start</th> <th>End</th> <th>Flaw Length</th> </tr> </thead> <tbody> <tr> <td>P5/1</td> <td>313 °</td> <td>351°</td> <td>1.83"</td> </tr> <tr> <td>P6/1</td> <td>343 °</td> <td>37°</td> <td>2.78"</td> </tr> <tr> <td>P6/2</td> <td>55 °</td> <td>74°</td> <td>0.97"</td> </tr> <tr> <td>P6/3</td> <td>87 °</td> <td>98°</td> <td>0.54"</td> </tr> <tr> <td>P6/4</td> <td>295 °</td> <td>327°</td> <td>1.65"</td> </tr> <tr> <td>P6/5</td> <td>199 °</td> <td>279°</td> <td>4.19"</td> </tr> <tr> <td>P6/6</td> <td>112 °</td> <td>145°</td> <td>1.71"</td> </tr> <tr> <td>P6/7</td> <td>175 °</td> <td>187°</td> <td>0.60"</td> </tr> </tbody> </table> <p>NOTE: Flaws 1 and 4 on P6 are the only flaws that appear to be through wall. Flaws 1,2,3,8 on P6 are on the top side of the weld and flaws 4,5,6,7,9 on P6 are on the bottom side of the weld.</p>	Weld/	Start Location			Flaw #	Start	End	Flaw Length	P5/1	313 °	351°	1.83"	P6/1	343 °	37°	2.78"	P6/2	55 °	74°	0.97"	P6/3	87 °	98°	0.54"	P6/4	295 °	327°	1.65"	P6/5	199 °	279°	4.19"	P6/6	112 °	145°	1.71"	P6/7	175 °	187°	0.60"
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		EVT	An enhanced visual examination was performed on all target welds that were not UT examined. No reportable indications were identified visually.																																								
	2000	VT-1	Header Piping Brackets to Vessel Wall																																								
		VT-1	Bracket Bolt Head Tack Welds																																								
		VT-3	General Condition of Brackets																																								
		VT-1	Clamp Assemblies on Tee Box Junctions																																								
		EVT-1	Flaw at 90° Tee Box for Crack Extension																																								
		EVT-1	Welds P5, P6, P7, P8a, P8b on all 4 Downcomers, and P4a, P4b, P4c, P4d on "A" Downcomer (13°)																																								
			The crack indication in the 90° core spray tee box to header weld was estimated to be five inches in length during the RF18																																								

	2001	VT-1	Refuel Outage. Image overlaying techniques along with pixel counting software were used to measure the indication during the RF19 Refuel Outage. These more reliable methods of measurement found the indication to be 2.25 inches in length.
		VT-1	Header piping to wall brackets.
		VT-1	Bracket Bolt Tack Welds
		VT-3	General condition of Brackets
		EVT-1	Flaw at 90 degrees tee box for crack extension. No change.
		EVT-1	Welds P5,P6,P7,P8a, P8b on all 4 downcomers. P4 (a-d) on "B" downcomer". No indications
Core Spray Sparger	1980's to present	VT-1	IEB 80-13 of welds on sparger. During the 1993 refueling outage, a circumferential crack indication on the core spray loop B header where the piping and the T-box meet was identified. A repair was installed during the 1994 outage. The repair is inspected every refueling outage. No problems have been identified to date.
	2000	EVT-1	Tee Box Cover Plate (S1), Sparger Branch Welds to Tee Box (S2), Sparger End Caps (S4)
		VT-1	Mounting Brackets and End Brackets (SB)
		EVT-1	Nozzle Welds (S3a, S3b)
		VT-3	Spargers <ul style="list-style-type: none"> • No reportable indications identified.
	2001	EVT-1	Tee box cover plate (S1), Sparger Branch welds to tee box (S2), Sparger End caps (S4). "B" and "C" spargers. No

		VT-1	indications. Brackets on "B" and "C" Spargers. No indications.
		EVT-1	Nozzle welds S3a and S3b on B and C. No indications.
		VT-3	Spargers B and C. No indications.
Top Guide (Rim, etc.)	1993 and 1994	VT-1	A VT-1 inspection was performed at 15 cell locations which were considered to be high fluence areas. No discrepancies were identified.
	1996 to present		Also inspected every outage are the Hold Down Latches, Top Guide Ring Bolts and Top Guide Beams. No indications have been identified to date.
	2000	VT-1	Ring Bolts (80 Total)
		VT-1	Hold Down Latches
		EVT-1	Rim Welds at 4 Locations Adjacent to Guide Blocks
		VT-3	Guide Blocks and Aligner Pins • No problems identified.
Core Plate (Rim, etc.)	N/A	N/A	N/A
SLC	1984 & 1989	LP	Section XI performed baseline in 1984 and reinspected in 1989, of the following welds: Nozzle number 10 was inspected at the inner radius to vessel weld, safe end weld, and tee to safe-end weld. Inspections have identified minor indications which appear to have been determined to be manufactured induced.
Jet Pump Assembly	1993-1996	VT-1	VT-1 of the following components performed every refueling outage for each jet pump:

<p>20 Jet Pump Assemblies</p>	<p>1998</p>	<p>EVT</p>	<ol style="list-style-type: none"> 1. Beam Bolt & Tack Welds. 2. Lock Plate, 2 Plug Welds, 4 Tack Welds. 3. Hold Down Beam (Latched Position) 4. Inlet. 5. Inlet Mixer Coupling. 6. Wedge and Restrainer. 7. Set Screw Tack Welds. 8. Transition Piece. 9. Upper (Original) Brace & Reclad Area. 10. Lower (Modification) Brace & Reclad Area. 11. Sensing Lines. <p>Item 7 above had Several tack welds cracked. Weld repair performed on 11 set screws during 1994 outage. Tack welds on jet pump #10 vessel side were discovered to be cracked during the 1996 outage. An evaluation was performed which justified operability of the set screw with the cracked tack welds. No repair was performed.</p> <p>A preemptive repair of the jet pump hold-down beams was performed during the 1982 refueling outage.</p> <p>During the 1989 refueling outage, a jet pump riser brace for jet pump # 7 and # 8 was discovered to be cracked. An evaluation was performed to justify operating with the cracked riser brace. Each refueling outage the crack is reinspected and compared with previous inspection results. To date, no crack growth has been reported.</p> <p>An Enhanced Visual Exam was performed on the high priority riser welds (RS-1, RS-2, RS-3) for Jet Pumps JP-3/4, JP-5/6, JP-7/8 JP-9/10, and JP-17/18. No reportable indications were identified.</p> <p>The following flaws were identified as a result of the IVVI exam:</p>
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			<p>JP-14, Beam Bolt Retainer Tack Weld crack like indication.</p> <p>JP-18, Crack like indication on upper leaf to yoke weld.</p> <p>JP-19, Beam Bolt Retainer Tack Weld crack like indication.</p> <p>All 20 Jet Pump Hold Down Beams were UT examined per the BWRVIP-41 document. JP-10 had an indication and was replaced. All other beams had no reportable indications.</p>
	2000	VT-1	Beam Bolt Keeper and Tack Welds
		VT-1	Lock Plate, Flat Head Screws, and Tack Welds
		VT-3	Hold Down Beam
		VT-3	Beam Bolt Retainer
		VT-3	Rams Head and Inlet Suction Area
		VT-1	Riser Brace Attachments to Vessel Pad (RB-1 on Primary and Secondary Riser Braces)
		VT-1	Riser Brace Leaf to Yoke Welds (RB-2 on Primary and Secondary Riser Braces)
		VT-1	Riser Brace to Riser Welds (RS-8 to RS-11 on Primary and Secondary Riser Braces)
		VT-3	Inlet to Mixer Clamp Bolting (IN-5)
		VT-1	Wedge Assembly
		VT-1	Restrainer Bracket, Set Screws, and Welds, Including Gaps
		VT-1	Slip Joint

		VT-1	Sensing Line Attachment Welds to Brackets
		VT-1	<p>Bracket to Diffuser Welds</p> <ul style="list-style-type: none"> • Crack indication in the #17 Jet pump beam bolt retainer tack weld. • Crack indication in the #10 jet pump vessel side restrainer set screw • Crack indication in the jet pump #19 secondary riser brace lower leaf to block weld. The indication appears to travel approximately 50% across the width of the leaf and is contained within the block material. It also appears to have propagated radially into the block to reactor vessel pad weld. <p>The examinations performed also reconfirmed previously recorded and unrepaired relevant indications in the following reactor vessel internal components:</p> <ul style="list-style-type: none"> • Crack indication in the #14 jet pump beam bolt retainer tack weld. (CR19980794) • Crack indication in the #19 jet pump beam bolt retainer tack weld. (CR19980794) • Crack indication in the 325° steam dryer jacking bolt tack weld. (CR19980794) • Crack indication in the #8 jet pump secondary riser brace lower leaf to vessel block weld. No apparent crack growth was observed. (SRI 89-028) <p>Due to enhanced inspection and</p>

			<p>measurement techniques, evaluation of the previously recorded indications on the following components has changed since the RF18 Refueling Outage:</p> <p>The crack indication previously reported in the #18 jet pump secondary riser brace upper leaf to yoke weld has been determined to be weld geometry. An RCS 600 color camera, along with auxiliary lighting was used to reinspect the previously recorded indication during the RF19 Refuel Outage. This technique clearly showed the indication to be the juncture of two weld passes.</p>
	2001	VT-1	Beam Bolt Keeper and Tack Welds
		VT-1	Lock Plate, Flat Head Screws, and Tack Welds.
		VT-3	Hold Down Beam
		VT-3	Beam Bolt Retainer
		VT-3	Rams Head and Inlet Suction Area
		EVT-1(11-18,20) VT-1 (1-10,19)	RB-1
		EVT-1(11-18,20) VT-1 (1-10,19)	RB-2
		EVT-1(11-18,20) VT-1 (1-10,19)	RS-8 to RS-11
		VT-1	Restrainer bracket , Set Screws, and welds (Including gaps)
Jet Pump Diffuser	1996	VT-1	Perform VT-1 inspection per the IVVI

	1998	UT	<p>program each refueling outage. No indications have been identified to date.</p> <p>The following Jet Pump Diffuser welds were UT examined from the ID per the BWRVIP-41 guidelines:</p> <table border="1"> <thead> <tr> <th>Jet Pump</th> <th>Weld #</th> <th>Coverage</th> <th>Results</th> </tr> </thead> <tbody> <tr> <td rowspan="5">JP-14</td> <td>DF-2</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>DF-3</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-3A</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-3B</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-2</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td rowspan="7">JP-16</td> <td>MX-2</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>MX-4</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>DF-2</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>DF-3</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-3A</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-3B</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-2</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td rowspan="5">JP-17</td> <td>DF-2</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>DF-2</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-3A</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-3B</td> <td>100%</td> <td>NRI</td> </tr> <tr> <td>AD-2</td> <td>100%</td> <td>NRI</td> </tr> </tbody> </table>	Jet Pump	Weld #	Coverage	Results	JP-14	DF-2	100%	NRI	DF-3	100%	NRI	AD-3A	100%	NRI	AD-3B	100%	NRI	AD-2	100%	NRI	JP-16	MX-2	100%	NRI	MX-4	100%	NRI	DF-2	100%	NRI	DF-3	100%	NRI	AD-3A	100%	NRI	AD-3B	100%	NRI	AD-2	100%	NRI	JP-17	DF-2	100%	NRI	DF-2	100%	NRI	AD-3A	100%	NRI	AD-3B	100%	NRI	AD-2	100%	NRI
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		EVT	<p>An Enhanced Visual Exam from the ID was performed on the high priority diffuser welds (DF-2, DF-3 and AD-2) for Jet pumps JP-11, JP-12, JP-13, JP-15, JP-18, JP-19 and JP-20. No reportable indications were identified.</p>																																																										
CRD Guide Tube	N/A	N/A	N/A																																																										
CRD Stub Tube	N/A	N/A	N/A																																																										
In-Core Housing	N/A	N/A	N/A																																																										
Dry Tube	80's to present	VT	<p>In 1987, 6 out of 12 dry tubes were replaced with a new improved design. Visual inspection performed on the remaining 6 old style dry tubes every other refueling outage. No problems have been observed to date.</p>																																																										
Instrument		VT-1	Visual inspection of the instrument lines																																																										

Penetrations			and penetrations performed per the IVVI program. No indications observed to date.
Vessel ID Brackets		VT-1	VT-1 inspections of jet pump riser brace, dryer, feedwater sparger, core spray, guide rod bracket and surveillance capsule holder brackets, performed every refueling outage. No problems identified to date.
LPCI Coupling	N/A	N/A	Not applicable to this plant.

Reactor Internals Inspection History

Plant: Peach Bottom Atomic Power Station, Unit 3

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1993	VT-1	<p>Enhanced VT-1 (1 mil resolution) (100% ID of H-3, H4, & V-3) portions OD of H-1, H-2, H-3, H-4, H-5, H-6, and H-7</p> <p>Prior to BWRVIP-01, Circumferential Indications on ID of H-3 and H-4 (Plate side, not ring side) Short circumferential indications on ID of V-3 weld.</p> <p>Evaluation of indications showed full structural margins for one operating cycle.</p>
	1995	UT	<p>Comprehensive UT Baseline of all Category "C" circumferential welds (H-1 through H-7).</p> <p>Baseline per BWR VIP-01, Rev. 1. Exams per BWR-VIP Core Shroud NDE Uncertainty and Procedure Standard, dated November 21, 1994.</p> <p>Indications identified on ID of H-1, H-3, H-4, and H-5.</p> <p>Full structural margins calculated using two cycles of crack growth.</p> <p>No indications identified on H-2, H-6, and H-7.</p>
	1999	UT	<p>UT Examination on welds H-3 & H-4. Re-identified indications on both welds. Extent of indications within existing structural analysis.</p>
Shroud Support	1993	VT-1	<p>Enhanced VT-1 (1 mil resolution), of portions of H-8 weld, No indications identified.</p> <p>VT-1 examination around perimeter of both access hole covers, No indications identified.</p>

	1999	EVT-1	10 % of weld length of welds H-8 & H-9 examined. No indications identified.
	2001	UT	10% of H-9 weld length from vessel O.D. No indications identified.
Core Spray Piping	1980 to present	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13,
	1985		Cracking discovered at tee-box to header pipe weld. Welded repair plates installed on both header tee-boxes.
	1993		Cracking identified in downcomer slip joint (weld P-5), evaluation demonstrated structural margin for one operating cycle.
	1995		Additional cracking identified in 3 of 4 downcomer slip joint welds (P-5), repair clamps installed on all 4 downcomers to repair flawed welds.
	1997	VT-1	4 Downcomer repair clamps, no indications identified.
		EVT-1	All annulus piping welds, no indications identified.
	1999	VT-1	VT-1 Examination of A, B, C & D Downcomer Repair Clamps & both Header Teebox welded repairs. No indications identified. All target welds plus 25 % sample of piping butt welds examined. No indications identified.
	2001	VT-1 EVT-1	VT-1 of both header tee box welded repairs, no indications identified. EVT-1 of all target welds plus 25% sample of butt welds examined. No

			indications identified.
Core Spray Sparger	1980 to present	VT-1 (1 mil)	Enhanced VT-1 (1 mil resolution) performed on piping and welds each refueling outage per IEB 80-13, No indications identified.
	1999	EVT-1	Examination performed on all Sparger Pipe welds.
		VT-1	Examination performed on all Brackets, Drains and 50 % of Nozzles. No indications identified.
Top Guide (Rim, etc.)	1987	UT	UT examination performed on 40 cells. No indications identified.
	1993	VT-3	Visual (VT-3) examination of 9 cells (02-19, 46-11, 42-59, 58-19, 02-39, 10-51, 18-03, 22-03, and 58-35), per SIL 554. No indications identified.
	1995	VT-3	Visual (VT-3) of 3 cells (14-23, 22-31, and 46-23) per SIL 554. No indications identified.
	1976 to present	VT-3	VT-3 examination every other refueling outage per Section XI. No indications identified.
	1997	VT-3 VT-1	Top Guide Grid examined from above, no indications identified. Adjacent aligner pins at 180 and 270 deg. (per VIP-26), no indications identified.
Core Plate (Rim, etc.)	1995	VT-3	VT-3 examination of hold down bolt retainers planned, deferred to 1997.
	1997	VT-1	Examined 18 of 34 bolts/retainers from above. No indications identified.
SLC	1997	UT	UT of nozzle to safe end planned for 1997, per BWRVIP recommendations.
		PT & UT	PT & UT of nozzle to safe-end weld, no

			indications identified.
Jet Pump Assembly	1974 to present	VT-3	Visual VT-3 of all jet pump components performed every other refueling outage. No indications identified.
	1981	VT & UT	VT and UT examination performed on all 20 hold down beams/ One beam found to be cracked, replaced with new style beam, All beams replaced with new style beam and reduced preload in 1988.
	1997	VT-3	VT-3 all 20 jet pump assemblies (all parts), including CSVT-1 (MVT-1) of 10 riser braces, including all welds. No indications identified.
		CSVT-1 (MVT-1)	CSVT-1 (MVT-1) all 10 thermal sleeve to riser elbow welds, plus UT on pumps 1/2, 9/10, 13/14 due to indications on thermal sleeve side of these welds. MVT-1 on welds RS-2 & RS-3 of three risers w/ indications @ 30, 150, and 300 degrees. Evaluation of indications justified continued operation for part cycle.
	1999	UT	Examinations performed on all 20 hold down beams. Reportable indications observed on hold down beam for jet pump # 20. Beam replaced. No other indications identified.
	EVT-1	Examination of high priority Adapter welds on Jet Pumps 1-10. Reportable indications on welds (AD-3b) of Jet pumps 2 & 10. BWR VIP -41 evaluation resulted in use-as-is disposition. Expanded examinations to weld AD3b on Jet Pumps 11-20. No other indications identified. EVT-1 examination of high priority Diffuser Shell to Tailpipe Welds (DF-2) of Jet Pumps 1-10. No indications identified. Examination of Riser welds RS-2 & RS-3 of Jet Pump Assemblies 2, 3 & 4. No indications identified.	
	2001	EVT-1	Reexamined weld AD-3b on Jet Pumps 2 & 10. indications remain bounded by

			existing flaw evaluation. All 20 WD-1 locations examined. 16 high priority and 45 medium priority welds on inlet mixers, diffusers, and riser braces also examined. No indications identified.
Jet Pump Diffuser			See Jet Pump Assembly
CRD Guide Tube	1985	VT-3	VT-3 PSI examination of 4 replacement CRD housings.
	1987	VT-3	VT-3 examination of one of replaced housings. No indications identified.
	1991	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
	1999	VT-3	VT-3 examination on Guide Tube welds CRGT-1 & Alignment Pin weld (Core Locations: 14-15, 14-31, 14-47, 18-19, 18-27, 18-35, 18-43, 26-11, 34-35, 42-19) No indications identified.
		EVT-1	EVT-1 examination on Guide Tube welds CRGT-2 & 3 (Core Locations: 14-15, 14-31, 14-47, 18-19, 18-27, 18-35, 18-43, 26-11, 34-35, 42-19) No indications identified.
CRD Stub Tube	1991	VT-3	VT-3 of accessible portions of 12 stub tubes (30-35, 26-35, 22-35, 22-31, 22-27, 26-27, 26-23, 30-23, 34-23, 34-27, 34-31, 30-31). No indications identified.
In-Core Housing	1991	VT-3	VT-3 of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
Dry Tube	1997	N/A	All Dry Tubes replaced in 1985. All IRM and SRM tubes replaced w/ Wide Range Monitoring tubes.

Instrument Penetrations	1976 to present	PT	PT examination performed on all instrument nozzle to safe end welds once per interval, per Section XI. No indications identified.
	1997	PT	PT nozzle to safe-end (coupling) & safe-end to pipe welds on 2 nozzles. (N12A & N12B) No indications identified.
Vessel ID Brackets	1976 to present	VT-1 or VT-3	VT-1 and VT-3 of all ID bracket welds performed once per interval No indications identified.
	1997	VT-1	All 10 Jet Pump riser brace to vessel welds, no indications identified.
	1999	EVT-1	EVT-1 examination performed on 8 Core Spray Bracket Pads @ 15, 117, 123, 165, 195, 237, 243 & 345 AZ. No indications identified.
	2001	EVT-1	EVT-1 examination performed on 4 Feedwater Sparger brackets @ 4, 56, 64, and 116 Az., 3 Jet Pump Riser Braces @ 90, 120, and 150 AZ., and 2 Steam Dryer Support Brackets @ 4, and 94 AZ. No indications identified.
LPCI Coupling			N/A for this plant