

2006-361 _____ BWR Vessel & Internals Project (BWRVIP)

August 9, 2006

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

Attention: Matthew A. Mitchell

Subject: Project No. 704 – BWR Vessel and Internals Inspection Summaries for Fall 2005 Outages

Enclosed are five (5) copies of the document entitled “BWR Vessel and Internals Project, Vessel Internals Inspection Summaries for Fall 2005 Outages, July 2006.”

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 document. If you have any questions on the enclosed document or the general subject of inspection results, please call Robin Dyle, BWRVIP Integration Committee Technical Chairman, Southern Nuclear Operating Company, at 205.992.5885.

Sincerely,



William A. Eaton
Entergy Operations, Inc.
Chairman, BWR Vessel and Internals Project

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D058

BWR Vessel and Internals Project

**Vessel Internals Inspection Summaries
for Fall 2005 Outages**

July 2006

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Reactor Internals Inspection History

Plant: Dresden Unit 2

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

	10/2003 D2R18	EVT-1, VT-1	new flaws. Growth within Fracture Mechanics Evaluation predictions. Performed EVT-1 of undemonstrated welds.
	11/2005 D2R19	UT, EVT-1	Excessive grinding exam of 1-4P4a and b (VT-1). Undemonstrated 1-4P8a and P4d (EVT-1). Flaws are unchanged. GE CSI-2000 inspected all demonstrated welds. Previous flaws re-sized, growth within flaw evaluation and BWRVIP-18 predictions. EVT-1 all undemonstrated welds. No new flaws identified. EVT-1 25% (2) piping bracket assembly welds. NRI.
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.
	3/1998 D2R16	EVT-1, MVT-1	End caps, cover plates and tee box branch welds were EVT-1 examined (OD). All sparger connections and bracket welds were MVT-1 examined. NRI.
	10/2001 D2R17	EVT-1, VT-1	Complete Target Set and 50% of S3 welds. No Indications recorded.
	11/2005 D2R19	EVT-1, VT-1	EVT-1 100% S1; S2a, b; S4a, b. NRI. VT-1 50% S3a, b. NRI. VT-1 100% (12) SB. NRI.
Vessel ID Brackets	4/1994 D2R15	VT-1	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. No indications noted.
	3/1998 D2R16	MVT-1	Inspected Core Spray Brackets per BWRVIP recommendations. NRI.
	10/2000 D2R17	VT-1 VT-3	100% (6) Surveillance Capsule Brackets. NRI. 100% (6) Guide Rod Attachments. NRI.

	10/2003 D2R18	EVT-1 EVT-1, VT-1	EVT-1 100% (4) Dryer Lugs. NRI. EVT-1 100% (4) Dryer Lugs. NRI. Eight feedwater sparger end-brackets VT-1, NRI. Eight Core Spray piping bracket welds, EVT-1, NRI.
	11/2005 D2R19	EVT-1, VT-1	EVT-1 100% (8) feedwater sparger end bracket to vessel attachments. NRI. VT-1 100% (8) feedwater sparger end bracket lug. NRI. EVT-1 100% (8) feedwater sparger end bracket pin tack weld. NRI. VT-1 feedwater sparger repair at 240°. RI. Hole in the weld of the repaired nozzle. Accepted as-is. EVT-1 25% (2) core spray piping bracket to vessel attachments. NRI. EVT-1 100% (4) steam dryer wall support lugs. NRI.
Core Shroud	8/1995 D2R14	EVT-1, UT	Inspections per BWRVIP Guidelines of all shroud repair design reliant structures prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspection of shroud consisted of EVT-1 of all ring segment welds (accessible surfaces), EVT-1 of between 43% and 72% of the length of each vertical weld between H1 & H2 from OD surface (ID not accessible), UT of between 30% and 50% of the length of each of the 6 beltline vertical welds, EVT-1 of between 43% and 72% of the length of 2 of the 3 vertical welds between H6 & H7 from OD surface (ID not accessible), and UT of 35% of the length of the remaining vertical weld between H6 and H7. No Reportable Indications.
	03/1998 D2R15	VT-1, VT- 3	Shroud repair hardware inspected per GE recommendations. NRI.
	10/1999	UT & EC	UT & EC examinations from the ID with

	D2R16		<p>the TEIDE 2 manipulator on the core shroud vertical welds V14, V15, V16, V17, V18, and V19 per the requirements of BWRVIP-76 for a repaired shroud. NRI. Coverages are as follows:</p> <p>V14: 80.1% V15: 80.1% V16: 83.4% V17: 52.6% V18: 62.8% V19: 58.0%</p>
	10/2001 D2R17	EVT-1	<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>
	11/2005 D2R19	EVT-1, VT-1	<p>EVT-1 100% (16) Ring Segment Welds from the OD. NRI. Coverages were 100% except for the following:</p> <p>V9: 85% V11: 95% V20: 0% (inaccessible due to Jet Pump diffuser) V21: 90% V24: 0% (inaccessible due to Jet Pump diffuser)</p> <p>Attempted EVT-1 of shroud vertical welds V29, V30, V31, V32. 0% coverage was achieved due to Jet Pump interference.</p> <p>Performed 10 year shroud tie rod examination of all four tie rods:</p> <ul style="list-style-type: none"> • EVT-1 of the clevis pin to verify if bottomed in slot and checking contact area for movement. NRI. • VT-1 of stabilizer assembly contact between the RPV wall and upper contact, mid support, and lower contact. RI @ 20 and 110 degrees. Accepted as-is. • VT-1 of retainer devices at lower support, lower spring to tie-rod

			<p>connection, upper spring jacking bolts and tie rod nut. NRI.</p> <ul style="list-style-type: none"> • VT-1 of contact of the stabilizer assembly between the shroud and upper and lower springs. NRI. • VT-1 of the core plate wedge contact. NRI.
Shroud Support	3/1993 D2R13	UT/VT-1	Access hole cover proactively replaced with GE mechanical design. UT for radial flaws performed prior to replacement. No indications identified.
	8/1995 D2R14	EVT-1, VT-1	EVT-1 of H8 and H9 for approx 12" at 4 locations of shroud repair hardware attachment areas. VT-1 of both replacement access hole cover assemblies. No indications identified.
	3/1998 D2R15	N/A	Not Inspected during D2R15
	10/1999 D2R16	EVT-1	Core Support Structures, Performed EVT-1 of H8 and H9 Welds per BWRVIP-38 requirements. No Recordable Indications Inspected both Shroud Access Hole Cover repairs, NRI.
	11/2005 D2R19	EVT-1, VT-3	EVT-1 H8 & H9 from 132-177°. NRI. VT-3 H9 100% accessible areas. NRI.
Top Guide	8/1995	VT-1	VT-1 of 5 cells. NRI. VT-1 of all 4 alignment assemblies. NRI. VT-1 of rim to bottom plate weld at 4 locations. NRI.
	3/1998 D2R15	N/A	No inspections during D2R15.
	10/2000 D2R16	EVT-1	Top Guide Alignment Pins, EVT 90° and 270° and Rim to Lower Plate Weld per BWRVIP-26. No Reportable Indications

	10/2003 D2R18	EVT-1, VT-1	Top Guide aligner assemblies at 0°, 180° and 270° welds (EVT-1) and pin (VT-1), NRI
	11/2005 D2R19	EVT-1	Top guide rim weld at 235° on the outboard side of cell 03-30. NRI.
SLC	11/2005 D2R19	Enhanced VT-2	Safe end and nozzle examined. NRI.
Jet Pump Assembly	8/1995 D2R14	VT-1 UT	Hold down beams, beam bolt keepers, lock-plates and retainers; restrainer wedges, stops, and adjusting screws, clamp bolts and keepers; riser brace assemblies, adapters and baffle plate welds, sensing lines and sensing line brackets per various SILS. Latest inspections were in 1995, with no reportable indications. Inspect 100% every other (even numbered) outage. Jet pump beams are UT examined each outage using technique capable of detecting cracking at throat and ears. One beam found cracked at ear in 1995 and was replaced.
	3/1998 D2R15	UT, EVT-1	D2R15 Beam UTs, NRI. Jet Pump Riser Welds RS-1,2,3,4 and 5 OD Inspected on all ten risers. Riser to JP Pair 15/16 has 1-1/2" long crack in elbow HAZ at RS-1. Evaluated for two cycles of operation without repair. NRI all others.
	01/2000 D2R16	UT, EVT-1	Jet Pump Beams, UT 100% of Beams NRI Riser Brace, Restrainer Bracket, Wedges and Inlet Mixers EVT-1 High/Medium Priority Welds Per BWRVIP-41 sample and inspection requirements. Minor Indications noted.
	10/2001 D2R17	UT, EVT-1	Jet Pump Beams, UT 100%, NRI Riser Brace Leaf at RPV wall block on JP#9, upper Rb 4 weld cracked. EVT-1 examined 100% scope expansion, no

	10/2003 D2R18	EVT-1	<p>other indications. Checked and found no set screw gaps. Examined for B-N-2. Measured known RS-1 crack on riser 15/16. No change in last two cycles.</p> <p>Replaced all 20 Jet Pump Beams with BWR4 weldless keeper beams Installed 19 Riser Brace Mitigation clamps one Repair on JP#9. Measured flaw on JP#15/16 RS-1. Increased from 1 1/2" to 2" length. Identified pup piece present on JP#5/6,</p>
	11/2005 D2R19	EVT-1, VT-1, VT-3	<p>VT-1 100% (20) WD-1. NRI. VT-3 100% (20) Jet Pump Bream Tooth Engagement. NRI. VT-1 100% (8) Jet Pump Sensing Line Clamps. RI (2). Teeth not fully engaged. Accepted as-is. EVT-1 30% (3) RS-4, 5. NRI. EVT-1 50% (5) RS-1, 2, 3. RI on JP 15/16 RS-1. Size confirmed to be 1 1/2 ". VT-1 100% (20) Jet Pump Riser Brace Clamps. RI (8). Teeth on keepers not fully engaged. Accepted as-is. EVT-1 AS-1, 2 on Jet Pumps 8, 9, 19 (AS-1 only). NRI VT-1 Aux. wedge on VS of Jet Pump 11. NRI.</p>
Jet Pump Diffuser	8/1995 D2R14	VT-1	Diffuser to baffle plate welds on all 20 jet pumps. No indications.
	3/1998 D2R15	N/A	Not inspected D2R15.
	01/2000 D2R16	EVT-1	JP Diffuser EVT-1 High/Med Priority welds per BWRVIP-41 sample and inspection requirements. NRI
	10/2001 D2R17	EVT-1	No scope D2R17.
	10/2003 D2R18	UT, EVT-1	UT examined Jet Pumps# 2, 3, 4, 5, 8, 9, 12, 13, 14, 15, 18 and 19. This completes first 6 Year Inspection Interval. NRI

	11/2005 D2R19	N/A	EVT-1 of the last of the Medium Priority 50% sample also completed. NRI. Not inspected in D2R19.
CRD Guide Tubes	8/1995 D2R14	VT-1 (1 MIL)	11 CRD guide tube lower assembly welds, 2 CRD guide tube upper assembly welds, 4 CRD guide tube alignment ear welds. NRI.
	3/1998 D2R15	N/A	Not inspected D2R15.
	01/2000 D2R16	N/A	Not inspected D2R16
	10/2001 D2R17	EVT-1, VT-3	5% inspected (9) per BWRVIP-47, CRDGT-1,2,3 and pin. NRI.
	11/2005 D2R19	N/A	Not inspected in D2R19.
CRD Stub Tubes	8/1995 D2R14	VT-1 (1 MIL)	14 CRD housing to CRD stub tube welds, 14 CRD stub tube to RPV bottom head welds, 3 CRD housing tube to housing cap welds. NRI.
	3/1998 D2R15		Not inspected D2R15
	10/2000 D2R16		Not inspected D2R16
	10/2001 D2R17		Stub Tubes not inspected D2R17
	10/2003 D2R18		Stub Tubes not inspected D2R18
	11/2005 D2R19		Not inspected in D2R19.
In-Core Housing	8/1995 D2R14	VT-1 (1 MIL)	4 incore guide tube to housing welds, 4 incore housing to RPV bottom head welds, 4 incore guide tube stabilizers. NRI.

	3/1998 D2R15		Not inspected D2R15
	11/2005 D2R19	N/A	Not inspected in D2R19.
Dry Tubes	8/1995 D2R14	VT-1	No indications identified. Examined every other outage.
	3/1998 D2R15		Not examined D2R15.
	10/2000 D2R16	VT-1	NRI.
	11/2005 D2R19	N/A	Not inspected in D2R19.
Instrument Penetrations	N/A		
LPCI Coupling	N/A		
Steam Dryer	11/2005 D2R19	VT-1 "best effort"	<p>Performed BWRVIP-139 required inspections as well as inspections of high-stress areas as determined by GE models. Internal start-up instrumentation piping was also examined. Several RI, including:</p> <ul style="list-style-type: none"> • Four of six gusset feet tip (adjacent to R2 weld), ranging from 7 to 11.5". Cracking was ground out and rewelded. Gusset feet extensions were designed and installed to transfer the stress riser to the mid-support ring. • Several internal strut/supports were identified with cracking. Several were historical from D2R18 inspections. No change in the cracking was observed. These welds are non-structural. Accepted as-is. • Vertical guide cracking (2) at 220°. Both cracks (2.5-5" in length) were stop-drilled. • Lower instrument line in Bank C observed cracking at the weld.

			<p>Performed fracture mechanics analysis and lost parts analysis. Acceptable as-is.</p> <ul style="list-style-type: none"> • Interior drain channel cracking (3). Performed GE analysis. Acceptable as-is. • Perforated plate weld cracking. Performed GE analysis. Acceptable as-is. • Perforated plate bowing. Performed GE analysis. Acceptable as-is.
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Reactor Internals Inspection History

Plant: Grand Gulf Nuclear Station Unit I

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	Fall 2005	UT	44% of H3 Lower Side, 56.6% H4 Both Sides, 17.3% H6A Both Sides and 74% H7 Both Sides. One indication with characteristics associated with IGSCC/IASCC was detected on the lower side of the H4 weld. Indication is 1.11" in length. Due to disassembly of the JP11 mixer, a VT-3 examination was performed on accessible areas of H10, H11 and H12. No indications.
	Spring 2004	UT	15.1% of H3 Lower Side and 34.6% of H4. Due to equipment failures this examination was deferred to next outage.
	Spring 1998	UT	All accessible areas of H3, H4, H6A, H7. No indications.
	Spring 1995	UT	Baseline per BWRVIP-01. All accessible areas of H3, H4, H6A and H7. No indications.
Shroud Support	Fall 2005	VT-1	SSHAC @ 0°. No indications
	Fall 2002	VT-1	SSHAC @ 0°. No indications
	Spring 1998	UT	10.7% of total circumference of H8 (shroud support plate to shroud weld) and 15.4% of H9 (shroud support plate to vessel weld). No indications.
	Fall 1996	VT-1	Sect XI. Period 3 of 10yr interval. RF05/6 Attachment welds to vessel and shroud plate to shroud weld. No indications.

	Spring 1995	VT-3	SSHAC @ 180°. No indications.
	Spring 1992	VT-1	Shroud shelf weld. No indications (Sil 572)
Core Spray Piping	Fall 2005	EVT-1	All target welds (P3a and P5) with 25% of remaining piping locations. No indications.
	Spring 2004	EVT-1	All target welds (P3a and P5) with 25% of remaining piping locations. No indications.
	Fall 2002	EVT-1	All target welds (P3a and P5) with 25% of remaining piping locations. No indications.
	Spring 2001	EVT-1	.All accessible P2, P2a, P3a, P5. 25% of remaining piping locations. No indications.
	Fall 1999	EVT-1	All accessible P2, P2a, P3a, P5. 25% of remaining piping locations. No indications.
	Spring, 1998	EVT-1	All accessible piping locations. No indications.
	Fall 1996	VT-3	Augmented exam per IE 80-13. No indications.
	Fall 1996	VT-1	Core spray bracket welds. No indications.
Core Spray Sparger	Fall 2005	VT-1/ EVT-1	All core spray sparger target welds and all accessible areas of the upper sparger welds. Accessible areas of Core Spray Sparger Brackets (SB). No indications. Broken tack welds @ Cap Screw 7A previously reported. Additional broken tack weld identified at Cap Screw 15C.
	Fall 2002	VT-1/VT-3	All core spray sparger target welds and all accessible areas of the lower sparger welds. No indications.

	Fall 1999	VT-1/VT-3	All accessible areas of Core Spray Brackets (SB). Broken tack welds @ Cap Screw 7A previously reported.
	Spring 1998	EVT-1/ CS-VT-1	Upper Sparger- Accessible areas of spargers, tee boxes, brackets and supports. No indications.
	Fall 1996	VT-3	Accessible areas of spargers, tee boxes, brackets and supports. Broken tack welds @ Cap Screw 7A
Top Guide (Rim, etc.)	Fall 1996	VT-3	Augmented exam per IE 80-13. No indications.
	Spring 2001	VT-3	Accessible surfaces and fasteners. No indications.
Core Plate (Rim, etc.)	Fall 1996	VT-3	Accessible surfaces and fasteners. No indications.
	Fall 1996	VT-3	Sect. XI, under core plate. Where access was provided in RF08, camera work was performed. No indications.
SLC	N/A	N/A	N/A
Jet Pump Assembly	Fall 2005	EVT-1	Wedge examinations were completed on 12 jet pumps. Wedge exams have been completed on all jet pumps with no indications. Examined one IN-1 and one IN-2 location with no indications.
	Spring 2004	EVT-1/ VT-1	Completed remaining examinations on JP 0304 and 0910. Completed baseline on 50% of low and medium priority locations and 100% of high priority (RS-3) locations. Identified and inspected an additional RS-1 weld at JP 0910 and inspected additional weld at the DF-3 locations. The additional weld at the DF-3 location was identified in the Fall 2002 outage (DF-3a). No indications.
	Fall 2002	EVT-1	All required locations for JP 0304 and JP 0910. Examination exceptions are RB-

	Spring 2001	EVT-1	1b, RB-1d, RB2a-d for JP0304; welds DF-1 for JP03 and JP04; DF-3 for JP03 and JP10; IN-1 and IN-2 for JP04; IN-2 for JP10. No indications.
	Fall 1999	EVT-1	Accessible areas of RS-1 and RS-2 welds on JP01/02. No indications.
	Spring 1998	MVT-1/ VT-3	Accessible area of RS-3 welds at JP07/08, JP09/10 and JP11/12. No indications
	Fall 1996	UT	Accessible areas of RS-3 weld on JP0102, JP0304 and JP0506. VT-3 on flow restriction on JP09, 10, 11 and 24. No indications.
	Fall 1996	VT-3	UT exam of beams. Two beams cracked in RF06, and all were replaced with Unit 2 spares. No UT exam done in RF07. In RF08 all beams were changed out with the new GE design and heat treat spec. components.
	Fall 1996	VT-3	Riser brace welds (Si1551) 50% each outage. Adjusting screws. 100 % each outage. No failures.
CRD Guide Tube	Fall 2002	EVT-1	CRGT-2 & 3 (10 places). FS/GT-ARPIN-1 (2 places). No indications.
	Spring 2001	VT-3	12 guide tubes. 12 FS/GT-ARPIN-1 and CRGT-1. Accessible portions of CRGT-2 (2 places). No indications
	Spring 1998	VT-3	34 CRGT-1 exams completed with no indications.
	Fall 1996	VT-3	8 guide tubes. When accessibility permits. No indications.
Dry Tube	Fall 2002	VT-1	Accessible areas of 6 LPRM dry tubes. No indications.
	Spring 1998	VT-3	11 guide tubes. No indications.

Instrument Penetrations	Fall 1996	VT-3	No indications.
Vessel ID Brackets	Fall 2005	VT-1/VT-3	Section XI CS Piping Brackets, FW Sparger End Brackets, Guide Rod Brackets (upper), Steam Dryer Brackets, Surveillance Sample Brackets and attachment welds at JP11 12. Due to disassembly of the JP11 mixer an examination was performed at one Shroud Support Stub weld. No indications.
	Spring 2004	VT-1	Section XI Jet Pump attachment welds at two locations was inspected. No indications.
	Fall 1996	VT-1/VT-3	Section XI every 10 years on Attachment welds. Other parts of brackets on general VT-3 exam. No indications.
LPCI Coupling	Fall 2005	VT-1	VT-1 on LPCI-C @ Az. 141 due to a previous loose parts impact concern. No indications.
	Fall 2002	EVT-1	All accessible areas @ Az 39. No indications. VT-1 on LPCI-C @ Az. 141 due to a previous loose parts impact concern. No indications.
	Spring 2001	VT-1	VT-1 on LPCI-C @ Az. 141 due to a previous loose parts impact concern. No indications.
	Fall 1999	VT-1	VT-1 on LPCI-C @ Az. 141 due to a previous loose parts impact concern. No indications.
	Spring 1998	EVT-1	All chosen welds on LPCI couplings @ Az 41 and 141. No indications.
	Spring 1996	VT-1	VT-1 on LPCI-C @ Az. 141 due to a previous loose parts impact concern. No indications.

Reactor Internals Inspection History

Plant: Peach Bottom Atomic Power Station, Unit 3

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

			H3, H4, and H5 correlated with those previously identified. One indication at H6 (new). One deep indication at H4. Characterized as thru-wall. Review of previous data (1995 and 1999) also characterized indication as thru-wall at that time. EVT-1 on OD surface did not identify any indications.
Shroud Support	1993	VT-1	Enhanced VT-1 (1 mil resolution), of portions of H-8 weld, No indications identified. VT-1 examination around perimeter of both access hole covers, No indications identified.
	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.
	2005	EVT-1	> 10% of H-8 weld, between jet pump banks, in area of AHCs.
		VT-3	Accessible length of H-9 between 0 and 180 degrees. 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

	1997	VT-1	repair flawed welds. 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	VT-1 of both header tee box welded repairs, no indications identified.
		EVT-1	EVT-1 of all target welds plus 25% sample of butt welds examined. No indications identified.
	2003	VT-1 EVT-1	Four downcomer repair clamps. Four Header Tee Box strong back repair plate welds. EVT-1 of all target welds plus 25% sample of butt welds. No indications identified.
	2005	EVT-1	Four Header Tee Box strong back repair plate welds. EVT-1 of all target welds plus 25% sample of butt welds. No indications identified.
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.

	2003	EVT-1	No indications identified. 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.
	2003	PT	Extended dwell time PT of SLC nozzle to safe end weld and entire safe end. 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. BWRVIP-41 evaluation resulted in use-as-is disposition. Expanded examinations to weld AD3b on Jet Pumps 11-20. No other indications identified. EVT-1 examination of high priority Diffuser Shell to Tailpipe Welds (DF-2) of Jet Pumps 1-10. No indications identified. Examination of Riser welds RS-2 & RS-3 of Jet Pump Assemblies 2, 3 & 4. No indications identified.

	2001	EVT-1	<p>Reexamined weld AD-3b on Jet Pumps 2 & 10. indications remain bounded by existing flaw evaluation.</p> <p>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.</p>
	2003	VT-1	<p>VT-1 of all twenty hold down beam ratchet lock keepers (replaced in 2001). VT-1 all twenty WD-1 main wedge locations, since all inlet mixers were removed in 2001, Two auxiliary spring wedges installed in 2001, and the RS-1 repair clamp on JP 1 & 2 and 13 & 14. No indications identified.</p>
		EVT-1	<p>Reexamination of indication at RS-1 weld on JP 9 & 10. Minimal change in flaw size. Structural reevaluation completed for continued acceptability.</p> <p>104% of High priority welds completed. 72% of Medium priority welds completed No indications identified.</p> <p>Indication identified in backing ring below AD-3a weld on JP 18. Structural evaluation found acceptable for continued operation.</p>
	2005	UT	<p>Two-sided UT of all diffuser and adapter welds (100) from I.D. Identified 4 small OD originating indications associated with the AD-3b fillet weld (2 previously ID'd). Structural and leakage evaluation proved acceptability for numerous operating cycles.</p>
		VT-1	<p>VT-1 of five main wedges. No wear identified.</p>

		EVT-1	EVT-1 of 16 medium priority welds. No indications identified. EVT-1 of 3 existing indications. No appreciable change in indication size.
Jet Pump Diffuser			See Jet Pump Assembly.
CRD Guide Tube	1985	VT-3	VT-3 PSI examination of 4 replacement CRD housings.
	1987	VT-3	VT-3 examination of one of replaced housings. No indications identified.
	1991	VT-3	VT-3 examination of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
	1999	VT-3	VT-3 examination on Guide Tube welds CRGT-1 & Alignment Pin weld (Core Locations: 14-15, 14-31, 14-47, 18-19, 18-27, 18-35, 18-43, 26-11, 34-35, 42-19) No indications identified.
		EVT-1	EVT-1 examination on Guide Tube welds CRGT-2 & 3 (Core Locations: 14-15, 14-31, 14-47, 18-19, 18-27, 18-35, 18-43, 26-11, 34-35, 42-19) No indications identified.
	2003	EVT-1	Best effort EVT-1 on Guide Tube welds CRGT-2 & 3 (Core locations: 10-35, 22-27, 22-35, 30-23, 30-31, 30-39, 38-27, 38-31, 38-35, and 42-31) No indications identified.
		VT-3	VT-3 examination on Guide Tube welds CRGT-1 & Alignment Pin weld (Core Locations: 10-35, 22-27, 22-35, 30-23, 30-31, 30-39, 38-27, 38-31, 38-35, and 42-31) No indications identified.
	2005	EVT-1	EVT-1 on Guide Tube welds CRGT-2 & 3 (Core locations: 22-39, 38-39, 14-35, 46-35, 46-27, 22-23, and 26-11) No indications identified. CRGT-3 (22-39)

		VT-3	later disqualified. VT-3 examination on Guide Tube welds CRGT-1 & Alignment Pin weld (Core Locations: 22-39, 38-39, 14-35, 46-35, 46-27, 22-23, and 26-11) Alignment pin weld also at 14-27 and 38-23, No indications identified.
CRD Stub Tube	1991	VT-3	VT-3 of accessible portions of 12 stub tubes (30-35, 26-35, 22-35, 22-31, 22-27, 26-27, 26-23, 30-23, 34-23, 34-27, 34-31, 30-31). No indications identified.
In-Core Housing	1991	VT-3	VT-3 of housings accessible from fuel cells 26-31 and 30-27. No indications identified.
Dry Tube	1997	N/A	All Dry Tubes replaced in 1985. All IRM and SRM tubes replaced w/ Wide Range Monitoring tubes in 1997. No inspections required.
Instrument Penetrations	1976 to present	PT	PT examination performed on all instrument nozzle to safe end welds once per interval, per Section XI. No indications identified.
	1997	PT	PT nozzle to safe-end (coupling) & safe-end to pipe welds on 2 nozzles. (N12A & N12B). No indications identified.
	2001	PT	PT nozzle to safe-end (coupling) welds on 2 nozzles. (N11A & N16A). No indications identified.
Vessel ID Brackets	1976 to present	VT-1 or VT-3	VT-1 and VT-3 of all ID bracket welds performed once per interval No indications identified.
	1997	VT-1	All 10 Jet Pump riser brace to vessel welds, no indications identified.
	1999	EVT-1	EVT-1 examination performed on 8 Core Spray Bracket Pads @ 15, 117, 123, 165, 195, 237, 243 & 345 AZ. No indications identified.

	2001	EVT-1	EVT-1 examination performed on 4 Feedwater Sparger brackets @ 4, 56, 64, and 116 Az., 3 Jet Pump Riser Braces @ 90, 120, and 150 AZ., and 2 Steam Dryer Support Brackets @ 4, and 94 AZ. No indications identified.
	2003	VT-1	Lower Surveillance Specimen brackets at 30°, 120°, and 300°.
		VT-3	Upper Surveillance brackets at 30°, 120°, and 300°. Guide Rod brackets at 0° and 180°.
		EVT-1 & VT-3	Steam Dryer support brackets at 184° and 274°.
		EVT-1	Jet Pump riser brace to vessel welds JP 9/10 and JP 13/14. No indications identified.
	2005	EVT-1	8 Feedwater sparger bracket welds and 16 jet pump riser brace welds. No indications identified.
LPCI Coupling			N/A for this plant
Steam Dryer	2003	VT-3	VT-3 of the entire top of the dryer (including all upper tie bars) and the 2 outer bank hoods and cover plates.
		VT-1	VT-1 of 5 new central bank upper tie bars (added in 2001), 2 stop-drilled indications at the lower guide rod followers, and all GE SIL 644, Supp. 1 locations on outer bank hoods. No indications identified. All previous repairs were satisfactory.
	2005	VT-1	Completed all remaining BWRVIP-139 recommended inspections (68 locations). No indications identified.

Reactor Internals Inspection History

Plant: Vermont Yankee

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
CRD Guide Tube	'95	N/A	None.
	'96	N/A	None.
	'98	N/A	None.
	'99	N/A	None.
	'01	EVT-1	Circumferential welds (CRGT-2 and CRGT-3) on four of 89 guide tubes. No indications.
		VT-3	Lugs and pin assemblies on four guide tubes. No indications.
	'02	N/A	None.
	'04	EVT-1	Circumferential welds (CRGT-2 and CRGT-3) on one of 89 guide tubes. No indications.
		VT-3	Lugs and pin assemblies on one guide tube. No indications.
CRD Stub Tube	'83	VT-3	2 of 89. No indications.
Core Plate	'95	VT-3	10 fuel support castings. No indications.
	'96	VT-3	Seven fuel support castings. No indications.
		VT-3	All 30 rim hold-down bolts from above. No indications.
	'98	VT-3	Four fuel support castings. No indications.

	'99	VT-3	16 rim hold-down bolts from above. No indications.
	'01	VT-3	15 rim hold-down bolts from above. No indications.
	'02	VT-3	15 rim hold-down bolts from above. No indications.
	'04	VT-3	15 rim hold-down bolts from above. No indications.
Core Shroud	'95	UT	Seven circumferential welds. Significant indications found in H5 and H6, less extensive in H4. Very minor indications in H1, H2, and H3.
	'96	UT, ET	Six vertical welds (all welds between H3 and H7). No indications.
		EVT-1	Two vertical welds (both welds between H1 and H2) – OD only. No indications.
		UT, ET	Six ring-segment welds (all three at top guide and all three at core plate). No indications.
		VT-3	Four tie-rods (repair) installed. Baseline inspection performed.
	'98	VT-3	Retorqued, reinspected all four tie-rods.
	'99	VT-3	Reinspected all four tie-rods.
	'01	N/A	None.
	'02	VT-3	Ten-year (3 rd Interval) Category B-N-2 core support structure inspection. No indications.
	'04	EVT-1	2' sections in four quadrants of H1, H2, and H3. All six vertical welds between H3 and H7. All three ring-segment welds at core plate. No indications. EVT-1 exams were from the shroud OD.

		VT-3	Two tie-rods. No indications.
	'05	EVT-1	Top Guide ring segment welds (3 welds) (NRI)
Core Shroud Support	'95	VT-1	Both access hole covers. No indications.
	'96	UT, ET	H8 (25%) & H9 (22%). No indications.
		VT-1	Both access hole covers. No indications.
	'98	MVT-1	Both access hole covers. No indications.
	'99	EVT-1	Both access hole covers. No indications.
	'01	N/A	None.
	'02	EVT-1	Both access hole covers. No indications.
		VT-3	Ten-year (3 rd Interval) Category B-N-2 core support structure inspection. No indications.
	'04	N/A	None.
	'05	EVT-1	10 % of H8 & H9 at 0 and 180 Degree locations. (NRI)
		EVT-1	Access hole Cover at 180 degree location (NRI)
		EVT-1	Core Shroud support short vertical welds (from outside the shroud) (NRI)
		VT-3	Annulus FOSAR (NRI)
Core Spray Piping	'95	CSVT-1	All piping and brackets. No indications.
	'96	UT	39 circumferential welds. Two collar-to-shroud welds (P8b) with indications.

		EVT-1	Five circumferential welds not accessible for UT. No indications.
		CSV-T-1	All brackets. No indications.
	'98	EVT-1	Reinspected eleven circumferential welds: two with previous indications, nine that were inaccessible for full UT in '96. No indications.
	'99	EVT-1	Reinspected 30 circumferential target welds. No indications.
	'01	EVT-1	Reinspected 32 circumferential target welds. No indications.
		UT	Four P9 welds. These UT inspections were invalidated by further BWRVIP qualification work performed May 2002.
	'02	EVT-1	Reinspected 34 circumferential target welds. No indications.
		EVT-1	Inspected all four piping brackets and attachment welds. No indications.
Core Spray Sparger	'04	EVT-1	Reinspected 34 circumferential target welds. No indications.
	'05	EVT-1	Reinspected 34 circumferential target welds (NRI)
	'95	CSV-T-1	100% IEB 80-13 inspections performed. No indications.
		VT-3	Repair clamp over tee-box plug (cracked weld) installed in 1980. No indications.
	'96	CSV-T-1	100% IEB 80-13 inspections performed. No indications.
		VT-3	Sparger tee-box repair. No indications.
	'98	MVT-1	17 of 20 large (tee-box to header, tee-box cover plate, and header to end cap)

			circumferential welds (3 inaccessible). No indications.
		VT-3	Sparger nozzles. No indications.
		VT-3	All twelve brackets. No indications.
		VT-3	Sparger Tee-box repair. No indications.
	'99	VT-3	Sparger Tee-box repair. No indications.
	'01	EVT-1	17 of 20 large circumferential welds mostly limited exams (3 inaccessible). No indications.
	'02	VT-1	50% of nozzles. No indications.
		VT-1	Inspected all 12 core spray sparger brackets. No indications.
Feedwater Spargers	'04	EVT-1	17 of 20 large (tee-box to header, tee- box cover plate, and header to end cap) circumferential welds (3 inaccessible). No indications.
	'05	VT-1	Nozzles on two of four spargers. Sparger tee-box repair. No indications.
		VT-1	Inspected all 12 Core Spray Sparger Brackets. (NRI)
	'95	MVT-1	Tee-box welds and end bracket attachment welds. No indications.
	'96	N/A	No FW sparger inspections performed.
	'98	VT-3	Piping and brackets. No indications.
	'99	MVT-1	Tee-box welds and end bracket attachment welds. No indications.
		N/A	No FW sparger inspections performed.
		VT-3	Piping and brackets. No indications.
	'01	VT-1	Tee-box welds and end bracket

	'02	EVT-1	attachment welds. No indications.
	'04	VT-3	End bracket attachment welds. No indications.
		VT-1	Piping and brackets. No indications.
			Tee-box welds and end bracket attachment welds. No indications.
In-Core Housing	'83	VT-3	2 of 89. No indications.
In-Core Dry Tubes	'95	VT-1, -3	Four dry tubes. No indications. (Dry tubes replaced in 1986 due to cracking.)
	'96	N/A	None.
	'98	N/A	None.
	'99	VT-1, -3	Two dry tubes. No indications.
	'01	N/A	None.
	'02	N/A	None.
	'04	VT-1, -3	Two dry tubes. No indications.
Instrument Penetrations	Every RFO	VT-2	Nuclear Boiler system pressure test during startup meets BWRVIP-49-A.
Jet Pump Assembly	'95	VT-3	Restrainer wedges and set screws, inlet bolted connections, sensing lines on five assemblies (50%). No indications.
		VT-1	Welds on five riser braces (50%). No indications.
	'96	VT-3	Restrainer wedges and set screws, inlet bolted connections, sensing lines on five assemblies (50%). No indications.
		VT-1	Welds on five riser braces (50%). No indications.
	'98	UT	26 of 30 Riser RS-1, RS-2, RS-3, circumferential welds. Four welds with

			indications – maximum approx. 3”.
		EVT-1	Remaining four riser RS-1 circumferential welds. No indications.
		MVT-1	Riser-to-restrainer RS-4, RS-5 welds on five assemblies (50%). No indications.
		MVT-1	Welds on five riser braces (50%). No indications.
		VT-1	Restrainer wedges on five assemblies (50%). No indications.
		VT-3	Restrainer set screws, inlet bolted connections, sensing lines on five assemblies (50%). No indications.
		UT	20 hold-down beams. One beam with UT indication on bolt hole replaced.
	'99	UT	160 mixer, diffuser, and adapter circumferential welds. Indications found on four diffuser welds, all less than 2”.
		EVT-1	20 mixer (MX-1) welds. No indications.
		UT	Ten hold-down beams. No indications.
	'01	UT	Four RS-1 welds with indications from 1998. Two 1998 indications determined to be lift-off. No growth on others.
		VT-1	Restrainer wedges on five assemblies (one loop). No indications.
		VT-3	Restrainer set screws, sensing lines on five assemblies (50%). No indications.
	'02	UT, VT-1	Beams. No indications.
		UT	Four diffuser welds with indications. Indications matched '99 indications

	'04	EVT-1	within NDE uncertainty. Two RS-1 welds with UT indications. Not seen visually.
		EVT-1	50% of RS-4, RS-5, RS-8, and RS-9 welds. 50% of riser brace welds. No indications.
		VT-3	50% of inlet bolted connections. No indications.
		VT-1	50% of restrainer wedges. No indications.
		VT-3	One loop (50%) of jet pump instrumentation lines. No indications.
	'05	EVT-1	Two RS-1 welds (H & K jet pumps) with UT indications. Not seen visually.
		EVT-1	Four diffuser welds with UT indications. Not seen visually.
LPCI Coupling	N/A	N/A	N/A
Miscellaneous Vessel ID Brackets	'95	VT-3	Reinspected one dryer support bracket with indication from 1992. No change.
	'96	UT	Reinspected same dryer support bracket from vessel OD. No change.
	'98	VT-3	Reinspected same dryer support bracket. No change.
	'99	N/A	None.
	'01	VT-3, UT	Reinspected same dryer support bracket. No change.
	'02	VT-3	Both guide rod bracket attachments. No indications.
		VT-3	All four steam dryer support brackets. Indication on one bracket unchanged.

		VT-3	All four steam dryer hold-down brackets. No indications.
		VT-1	Six surveillance specimen holder brackets. No indications.
	'04	VT-1	Upper surface of steam dryer support brackets. No indications.
SLC	'95	N/A	No SLC BWRVIP inspections.
	'96	N/A	No SLC BWRVIP inspections.
	'98	EVT-2	Nozzle-to-safe-end weld. No indications.
	'99	EVT-2	Nozzle-to-safe-end weld. No indications.
	'01	EVT-2	Nozzle-to-safe-end weld. No indications.
	'02	PT	Nozzle-to-safe-end weld. No indications.
	'04	PT	Nozzle-to-safe-end weld and safe-end. No indications.
Steam Dryer and Separator	'95	UT	All shroud head hold-down bolts. Nine bolts with indications.
	'96	N/A	Replaced all steam separator / shroud head hold-down bolts.
	'98	VT-3	Steam dryer and separator. Indications on five tack welds on three jacking bolt (lifting eye) assemblies on the steam dryer.
	'99	VT-3	Reinspected cracked tack welds on steam dryer. No change.
	'01	N/A	None.
	'02	VT-1/3	Inspected dryer cover plates and welds and start-up instrumentation remnant. No indications.

	'04	VT-1/3	Baseline inspection of entire steam dryer, OD and ID (all accessible welds: VT-1 and plates: VT-3). Two fatigue cracks in steam dam welds repaired. 16 horizontal cracks in interior vertical end plates evaluated as acceptable for service. Two IGSCC cracks in interior vertical weld and drainpipe weld evaluated as acceptable for service. Pre-emptive repair (strengthening plates and gussets) installed on cover plates and upper hood.
	'05	VT-3	Steam separator – full top and periphery inspection. No indications.
		VT-1	Re-inspection of two repaired cracks in the steam dam welds repaired in 04. (NRI)
		VT-1	Drain channel weld and drain pipe weld evaluated acceptable for service in '04.(no discernable changes)
		VT-1	Re-inspection of pre-emptive repair on the strengthening plates and gussets. (NRI)
		VT-1	High stressed vertical welds interior and exterior surfaces per SIL-644 R/1 and BWRVIP-139. (NRI)
		VT-1	High stressed horizontal welds interior and exterior surfaces per SIL-644 R/1 and BWRVIP-139. (NRI)
		VT-1	Tie bars, steam dam gussets. (NRI)
		VT-1	Lifting Support hardware. (NRI)
		VT-1	Dryer leveling screw tack welds. (NRI)
		VT-1	All internal vertical weld steam dryer vane end unit to plate welds. 62 indications total found. 16 indication in

		VT-1	'04 and 44 indications in '05. Evaluated acceptable for service.
		VT-1	6 internal strut welds. (NRI)
Surveillance Specimen Holders	'02	VT-3	Both remaining surveillance specimen holders. No indications.
Top Guide	'95	VT-1	Ten locations in top guide grid IAW SIL-554. No indications.
	'96	VT-1	Seven locations in top guide grid IAW SIL-554. No indications.
	'98	MVT-1	Four locations in top guide grid IAW SIL-554. No indications.
	'99	VT-1	Two aligner assemblies. No indications.
		VT-1	Two hold-down assemblies. No indications.
		VT-1	Four locations in top guide grid. No indications.
	'01	VT-3	25% of rim and cover sheet bolts (NNS). No indications.
	'02	VT-1	Two hold-down assemblies. No indications.
	'04	N/A	None.
	'05	VT-1	Two hold-down assemblies at 18 and 198 degree locations. (NRI)