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(by e-mail)

BWR Vessel & Internals Project (BWRVIP)

February 7, 2018

PROJ0704

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

Attention: Joseph Holonich

Subject: Project No. 704 – BWR Vessel and Internals Inspection Summaries for Spring 2017 Outages

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

The information provided in the enclosed document identifies the BWR internal components inspected and generally includes the date or frequency of inspection, the inspection method used and a summary of results including repair or replacement activities. The enclosed document is being provided to the NRC for information only.

The information contained in the enclosed document was developed by the individual utilities and has been compiled into the enclosed document by the BWRVIP. The BWRVIP plans to continue to gather such information and to provide periodic updates such as in the enclosed document.

Representatives of the BWRVIP would be pleased to meet with the NRC staff to discuss any comments or questions related to the enclosed document. If you have any questions on the enclosed document or the general subject of inspection results, please call Drew Odell, BWRVIP Integration Committee Technical Chairman, Exelon, 610.212.1155.

Sincerely,

A. O. McGehee

Tim Hanley

G004
NRR

Andrew McGehee, EPRI, BWRVIP Program Manager
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BWR Vessel and Internals Project

Vessel Internals Inspection Summaries for Spring 2017 Outages

December 2017

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Reactor Internals Inspection History

Plant: _ **Browns Ferry Nuclear Plant: Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1994	UT	Baseline (1994) per GE SIL No. 572 for circumferential seam welds - indications found in several welds (H2, H3, H5).
	1996	UT	Reinspection (1996) per GE SIL No. 572 - indications found in H1, H6, and H7 welds along with previous indications. Full structural margins on flawed welds for at least one additional operating cycle. Vertical welds not inspected.
	1997	UT	Reinspection (1997): UT examination of H1, H2, H3, H4, H5, H6, & H7 performed per BWRVIP I&E guideline. Six new indications recorded. All other indications recorded in earlier outages exhibited no significant flaw growth. Satisfactory structural margins on the flawed welds for at least one additional operating cycle. Vertical welds not inspected. All seven horizontal welds will be reinspected in 2007, along with any required vertical welds.
	2007	UT	Reinspection (2007): UT examination of H1 (single-sided) and H2, H3, H4, H5, H6, H7, V7, and V8 (two-sided) performed per BWRVIP-76. The length of the weld inspected was at least 50 percent of the weld circumference in all cases. Flaws observed in six (H1, H2, H3, H4, H5, & H7) horizontal welds were less than 20 percent of examined length. Barring license renewal impacts, all seven horizontal welds (along with any required vertical welds) will not be reinspected until 2017.
	2017	UT	Reinspection (2017) per BWRVIP-76-R1-A: UT (two-sided) examination of H1-H7 (H1 Upper was baseline inspection), V7, and V8. Results as follows:

			Weld #/Scan Side/% Coverage/% Flawed H1 / Upper / 82.6% / 0.2% H1 / Lower / 84.5% / 1.5% H2 / Upper / 76.6% / 2.0% H2 / Lower / 83.2% / 0.0% H3 / Upper / 83.2% / 0.0% H3 / Lower / 79.4% / 20.6% H4 / Upper / 98.8% / 0.0% H4 / Lower / 97.0% / 0.0% H5 / Upper / 98.1% / 1.6% H5 / Lower / 98.4% / 0.0% H6 / Upper / 98.6% / 0.0% H6 / Lower / 99.4% / 8.5% H7 / Upper / 97.8% / 11.1% H7 / Lower / 65.9% / 0.0% V7 / CCW Side / 90.5% / 0.0% V7 / CW Side / 90.9% / 0.0% V8 / CCW Side / 88.1% / 0.0% V8 / CW Side / 88.4% / 0.0%
		EVT-1	Off-Axis Cracking Examination (2017) per BWRVIP Letter 2016-030: EVT-1 visual examination of Welds H4 (40°-50°, 130°-140°, 160°-180°, 180°-200°, 220°-230°, & 310°-320°), V3 (40" of both HAZ's starting from H4), and V6 (40" of both HAZ's starting from H5). No relevant indications were observed.
Shroud Support	1996	EVT-1, UT	(1996): Access Hole Cover Welds at 0° and 180° UT examined in both the radial and circumferential directions per the requirements of GE SIL No. 462. No reportable indications on either cover.
	1999	EVT-1	Baseline (1999): EVT-1 inspection per BWRVIP-38 for Shroud Support Welds H-8 and H-9 at 0 and 180 degree locations. No reportable indications. Reinspection (1999): UT inspection of access hole cover locations at 0 and 180 degrees. No reportable indications.
	2005	EVT-1, UT	Reinspection (2005) of access hole cover locations at 0 and 180 degrees per GE SIL No. 462 R1 (EVT-1). No reportable indications were found.

			Reinspection (2005) of Shroud Support Welds H-8 (EVT-1) and H-9 (manual UT) per BWRVIP-38, -104. No reportable indications were found.
	2009	EVT-1, UT	(2009): Baseline UT inspection using phased array per BWRVIP-180 of access hole cover locations at 0 and 180 degrees. Supplemental EVT-1 examinations performed of those areas that were not accessible for UT. No relevant indications.
	2011	EVT-1	Reinspection (2011) of Shroud Support Weld H-8 (EVT-1) per BWRVIP-38. No relevant indications.
	2015	EVT-1, UT	Reinspection (2015) using phased array per BWRVIP-180 of access hole cover locations at 0 and 180 degrees. Supplemental EVT-1 examinations performed of those areas that were not accessible for UT. No relevant indications. Reinspection (2015) of Shroud Support Weld H-9 (EVT-1) per BWRVIP-38. No relevant indications.
	2017	EVT-1	Reinspection (2017) of Shroud Support Weld H-8 per BWRVIP-38: EVT-1 visual examination from AZ 160°-200° and 340°-020°. No relevant indications were observed.
Core Spray Piping	1996	EVT-1, VT-1, VT-3	(1996): Inspection per IEB 80-13/GE SIL No. 289 R1S2 of piping and welds in annulus. No reportable indications.
	1997	EVT-1, UT, VT-1	Baseline inspection (1997) per BWRVIP-18: Inspected all accessible welds (T-Box, welds on Downcomers "A", "B", "C", & "D") with UT and inaccessible welds (Piping Bracket (PB) welds) with VT. No reportable indications.
	1999	EVT-1	(1999) Inspected Piping Bracket (PB) welds; P4d, P8a, P8b welds on "A", "B", "C", "D" downcomers) per BWRVIP-18 (EVT-1). No reportable indications.

	2001	EVT-1, UT, VT-1	Reinspection (2001) per BWRVIP-18: EVT-1 visual examination of T-Box welds. No reportable indications. UT examination of Downcomer "A" elbow welds and Downcomer "A", "B", "C", & "D" sleeve welds. No reportable indications.
	2003	EVT-1, UT, VT-1	Reinspection (2003) per BWRVIP-18: EVT-1 visual examination of T- Box welds. No reportable indications.
	2005	EVT-1, UT, VT-1	Reinspection (2005) per BWRVIP-18: EVT-1 visual inspections (T-Box welds @ 120 degrees and 240 degrees). No reportable indications. UT examination of Downcomer "B" elbow welds and Downcomer "A", "B", "C", & "D" sleeve welds. No reportable indications.
	2007	EVT-1, UT, VT-1	Reinspection (2007) per BWRVIP-18: EVT-1 visual examinations (T-Box welds @ 120 and 240 degrees, Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees). No reportable indications.
	2009	EVT-1, UT, VT-1	Reinspection (2009) per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 and 240 degrees). No reportable indications. UT examination of Downcomer "C" elbow welds and Downcomer "A", "B", "C", & "D" sleeve welds (supplemental EVT-1 on Welds 8a and 8b). No relevant indications.
	2011	EVT-1	Reinspection (2011) per BWRVIP-18, Rev. 1: EVT-1 visual inspections (T-Box welds @ 120 and 240 degrees, Downcomer "C" elbow welds (P4a-d) and Downcomer "A"-"D" sleeve welds (P8a and P8b)). No relevant indications.
	2013	UT, EVT-1	Reinspection (2013) per BWRVIP-18-R1-A: EVT-1 visual inspections (T-Box welds @120 (P1, P2, AP3, BP3) and 240 (P1, P2, CP3, DP3); no relevant indications were observed. UT of elbow and sleeve welds (P4a, P4b, P4c, P4d, P5, P6, P7, P8a, & P8b) performed for Downcomers A through D. One indication (0.94") observed on Weld P8a

			on A Downcomer. One indication (1.94") observed on Weld P4c on B Downcomer. Evaluation performed by SIA showed piping is acceptable as-is for two cycles. Welds will be reinspected (UT) during U2R19 (2017); EVT-1 will be performed during U2R18 (2015). Supplemental EVT-1 visual inspection performed for P4a, P4b, P4c, P4d, P8a, and P8b; no relevant indications noted.
	2015	EVT-1	Reinspection (2015) per BWRVIP-18, R1-A: EVT-1 visual inspections (T-Box welds @ 120 & 240 degrees, Downcomer "A"-"D" elbow welds (P4a-d) and sleeve welds (P8a and P8b)); no relevant indications. Piping Bracket (PB) welds @ 15, 110, 130, 165, 195, 230, 250, and 345 degrees); tack weld between the bolt threads & lower stud of the bracket @ 165 deg.was partially cracked but intact.
	2017	UT, EVT-1	Reinspection (2017) per BWRVIP-18, R2-A: UT inspection of (T-Box welds @120° (P1, P2, AP3, BP3) and 240° (P1, P2, CP3, DP3); no relevant indications were observed. (NOTE: P1 and DP3 remain on EVT-1 inspection interval due to inadequate UT coverage). UT inspection of elbow and sleeve welds (P4a, P4b, P4c, P5, P6, P7, P8a, & P8b) performed for Downcomers A through D. Indication observed during U2R17 in 2013 on Weld P8a on A Downcomer had grown to 1.30" and indication observed during U2R17 in 2013 on Weld P4c on B Downcomer had grown to 2.90". Evaluation performed by SIA showed piping is acceptable as-is for two cycles. Welds will be reinspected (UT) during U2R21 (2021). No other relevant indications were observed. EVT-1 visual inspection of sleeve weld P4d performed for Downcomers A through D (weld is inaccessible to UT); no relevant indications were observed. EVT-1 visual inspection performed for the Piping Bracket (PB) weld at 165°; the tack weld between the bolt threads and the lower

			stud of the piping bracket that was observed to be partially cracked during U2R18 in 2015 was unchanged. The outer tack weld between the pipe restraining clamp and the bolt head had no relevant indications, so the indication was determined to be acceptable for one fuel cycle. It will be reexamined during U2R20 in 2019.
Core Spray Sparger	1996	EVT-1, VT-1, VT-3	(1996): Inspection per IEB 80-13 of welds on sparger. One small indication in lower tack weld of the nozzle to "B" sparger in Nozzle 3B. No other indications were recorded.
	1997	EVT-1, VT-1, VT-3	Reinspection (1997): No reportable indications found. Small linear indication on tack weld for Nozzle 3B observed during 1996 exam was not found upon reexamination.
	1999	EVT-1, VT-1, VT-3	Reinspection (1999) per BWRVIP-18: EVT-1 and VT-3 of sparger welds. No reportable indications found.
	2003	EVT-1, VT-1, VT-3	Reinspection (2003) per BWRVIP-18: EVT-1 (S1, S2, S4) and VT-1 (S3a, S3b, S3c, SB) inspections of sparger welds. No reportable indications.
	2007	EVT-1, VT-1, VT-3	Reinspection (2007) per BWRVIP-18: EVT-1 (S1, S2, S4) and VT-1 (S3a, S3b, S3c, SB) inspections of sparger welds. Upper Sparger bracket at 273 degrees is displaced from the lower brackets. Otherwise, no reportable indications.
	2011	EVT-1, VT-1, VT-3	Reinspection (2011) per BWRVIP-18, Rev. 1: EVT-1 (S1, S2, S4) and VT-1 (S3a, S3b, S3c, SB) inspections of sparger welds. No relevant indications.
	2015	EVT-1, VT-1	Reinspection (2015) per BWRVIP-18, Rev. 1: EVT-1 (S1, S2, S4) and VT-1 (S3a, S3b, S3c, SB) inspections of sparger welds. No relevant indications.
Top Guide (Rim, etc.)	1996	EVT-1, VT-1, VT-3	(1996): Lower side of beams (in cells where fuel and blade guides are removed) VT-3 inspected in accordance with GE SIL No. 554. No indications were recorded.

	1997	EVT-1, VT-1, VT-3	Reinspected (1997): Top Guide Alignment Pins & Bolts visually inspected per SIL 588. No indications found.
	1999	EVT-1, VT-1, VT-3	Baseline inspection (1999) per BWRVIP-26: Inspected Rim Welds (Location 11) (EVT-1) and Aligner Pins (Locations 2/3) (VT-1) at 2 locations. No reportable indications found.
	2001	EVT-1, VT-1, VT-3	Expanded baseline inspection (2001) per BWRVIP-26: Locations 1, 4, 6, 10, 12, 13, 15, and 16 EVT-1 inspected; no reportable indications
	2003	EVT-1, VT-1, VT-3	Reinspection (2003) per BWRVIP-26: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) examined on two adjacent aligner assemblies with no reportable indications.
	2007	EVT-1, VT-1,	Reinspection (2007) per BWRVIP-26: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) examined on two adjacent aligner assemblies with no reportable indications.
	2011	EVT-1, VT-1	Baseline (2011) per BWRVIP-183: Location 1 (Grid Beam and Beam-to-Beam Crevice Slot) inspected (EVT-1) for two grid beam cells; no reportable indications. Reinspection (2011) per BWRVIP-26: Locations 2 and 3 (VT-1) and Location 11 (EVT-1) examined on two adjacent aligner assemblies with no reportable indications.
	2013	EVT-1	Baseline (2013) per BWRVIP-183: Location 1 (Grid Beam and Beam-to-Beam Crevice Slot) inspected (EVT-1) for three grid beam cells; no reportable indications.
	2015	EVT-1, VT-1	Baseline (2015) per BWRVIP-183: Location 1 (Grid Beam and Beam-to-Beam Crevice Slot) inspected (EVT-1) for five grid beam cells; no reportable indications. Reinspection (2015) per BWRVIP-26: Locations 2 and 3 on two adjacent aligner assemblies (VT-1) and accessible areas of Location 11 (EVT-1) examined with no relevant indications.

Core Plate (Rim, etc.)	1996	VT-3	(1996): The core plate bolts were visually inspected in accordance with GE SIL No. 588. No indications were recorded.
	1997	VT-3	Reinspected (1997) per BWRVIP-25 with one plug not seated; otherwise no indications found.
	1999	VT-3	(1999): Inspected core plate bolts (VT-3) at accessible locations per BWRVIP-25 with no reportable indications.
	2001	VT-3	Reinspection (2001) per BWRVIP-25: Holddown Bolts (Location 10) VT-3 inspected with no reportable indications. Plugs (Location 13) VT-3 inspected with no reportable indications. Aligner Pin Socket to Rim Welds (Location 8) were inaccessible.
	2003	VT-3	Reinspection (2003) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected with no reportable indications. Fifteen (15) plugs (Location 13) were VT-3 inspected with no reportable indications.
	2005	VT-3	Reinspection (2005) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected with no reportable indications. Thirty-three (33) plugs (Location 13) were VT-3 inspected with no reportable indications.
	2007	VT-3	Reinspection (2007) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected with no reportable indications. Sixteen (16) plugs (Location 13) were VT-3 inspected with no reportable indications.
	2009	VT-3	Reinspection (2009) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected with no relevant indications. Core plate plugs (Location 13) adjacent to three (3) control rod guide tubes inspected with no relevant indications.

	2011	VT-3	Reinspection (2011) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications.
	2013	VT-3	Reinspection (2013) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications. Forty-two (42) plugs (Location 13) were replaced with newer, more IGSCC-resistant plugs. Plug at location 32-49E could not be removed due to interference with the guide tube ear and will replaced during U2R18 (2015).
	2015	VT-3	Reinspection (2015) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications. Plug at location 32-49E (Location 13), which could not be replaced during U2R17 (2013) due to interference with the guide tube ear was replaced with a newer, more IGSCC-resistant plug. In addition, three (3) plugs (24-41N, 24-49S, and 24-49W) were withdrawn for use in the SIA Life Extension project and were replaced with new plugs. Forty-two (42) replacement plugs installed during U2R17 were inspected to confirm that the replacement plug was in place and the hardware had not changed from the as-installed condition. Plug at location 56-25S was not seated and required replacement. The five plugs replaced during U2R18 will be inspected during U2R19 (2017) to confirm the plugs are still in place.
	2017	VT-3	Reinspection (2017) per BWRVIP-25: All thirty-four (34) holddown bolts (Location 10) were VT-3 inspected from above with no relevant indications. 5 plugs replaced during U2R18 in 2015 were inspected to confirm that the replacement plug was in place and the hardware had not changed from the as-installed condition. No relevant indications were observed. The 83

			remaining original core plate plugs were replaced due to end-of-life concerns. The plug at Location 46-31 came apart during installation, causing an FME event and necessitating a general condition VT-3 below the Core Plate (bottom side of Core Plate, Guide Tubes, In-Core Housings, CRD Housings, Stub Tubes, and RPV Bottom Head) while retrieving the core plate plug part. No relevant indications were noted. A sampling of the 83 plugs replaced during U2R19 will be inspected during U2R20 (2019) to confirm the plugs are still in place.
SLC	Prior to 2005	VT-2	(Prior to 2005): Nozzle is leak checked every outage and volumetric exams are conducted per ASME Section XI code requirements. No indications noted.
	2005	EVT-2	(2005): Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.
	2007	EVT-2	(2007): Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No reportable indications found.
	2009	EVT-2	(2009): Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications found.
	2011	EVT-2	(2011): Bare metal examination (EVT-2) performed per BWRVIP-03, -27. No relevant indications found.
		UT	(2011): UT performed on SLC Injection Nozzles N10 (stainless steel safe end-to-pipe weld); no recordable indications noted.
	2013	EVT-2	(2013): Bare metal examination (EVT-2) performed per BWRVIP-03, -27-A. No relevant indications found.
		UT	(2013): UT performed on SLC Injection Nozzle N10 (stainless steel safe end-to-pipe weld); no relevant indications found.

	2015	EVT-2	(2015): Bare metal examination (EVT-2) performed per BWRVIP-03, -27-A. No relevant indications found.
		UT	(2015): UT performed on SLC Injection Nozzle N10 (stainless steel safe end-to-pipe weld); no relevant indications found.
	2017	EVT-2	(2017): UT performed on SLC Injection Nozzle N10 (stainless steel safe end-to-pipe weld); no relevant indications found.
		UT	(2017): UT performed on SLC Injection Nozzle N10 (stainless steel safe end-to-pipe weld); no relevant indications found.
Jet Pump Assembly	1996	EVT-1, MVT-1, VT-1, VT-3	(1996): VT-3 inspection of sensing lines per GE SIL No. 420 - no indications recorded. Jet pump throats inspected per GE SIL No. 465 for Jet Pumps 11 & 12 - build-up found in inlet mixer that may require internal cleaning during next refueling outage. Riser braces for Jet Pumps 11-20 VT-1 inspected per GE SIL No. 551 - no indications were recorded. Jet pump adjusting screws VT-1 inspected per GE SIL No. 574 - minor indications on set screw tack welds for Jet Pumps 1, 11, & 12 that were evaluated and determined to be irrelevant due to their small size. NOTE: Group I jet pump beams were replaced with Group II beams (that are high temp. annealed and have a reduced preload) during the Cycle 4 Outage (1983).
	1997	EVT-1, MVT-1, VT-1, VT-3	Reinspected (1997): Jet Pumps 1 thru 20 - Adjusting Screws (VT-3), Riser Elbow Welds (MVT-1), & Sensing Lines. Jet Pumps 1 thru 10 - Riser Braces. GE SIL Nos. 574, 551, 60, 420, & RICSIL 078 used as guidance. Previous indication on set screw tack weld for Jet Pump 1 not found. Previous indication on set screw tack welds for Jet Pumps 11 & 12 unchanged. Slight gap observed on shroud-side set screw for Jet Pump Nos. 7 & 16, vessel-side set screw for Jet Pump No. 14. No other reportable indications.

	1999	EVT-1, VT-1, VT-3	Baseline (1999) per BWRVIP-41: VT-3 of holddown beam locations BB-1 and BB-2 to verify proper function of beam (all 20 jet pumps) - no indications. EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, AD-3b (all 20 jet pumps); no reportable indications.
	2001	EVT-1, VT-1	Baseline (2001) per BWRVIP-41: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d; no reportable indications.
	2003	EVT-1, VT-1	Baseline (2003) per BWRVIP-41: EVT-1 of holddown beam locations BB-1 and BB-2 (Jet Pumps 11 thru 20) - no reportable indications. EVT-1 of Medium Priority Locations RS-6, RS-7, RS-8, RS-9, IN-4, MX-2, DF-1 (Jet Pumps 11 thru 20); no reportable indications. VT-1 of Medium Priority Location WD-1; wear noted on inlet-mixer wedge and restrainer bracket pad for Jet Pump Nos. 13, 14, 17 (the most severe), and 20. Scope expanded to perform VT-1 of WD-1 for Jet Pumps 1 thru 10; wear noted on inlet-mixer wedge/restrainer bracket pad for Jet Pump No. 4. Reinspection (EVT-1) of Riser Brace Welds RB-1a-d and Riser Pipe Weld RS-1 (Jet Pumps 3/4, 13/14, 17/18, 19/20), along with additional baseline inspection (EVT-1) of Riser Pipe Welds RS-8 and RS-9 (Jet Pumps 3/4) performed per Justification for Continued Operation (JCO) issued for continued operation of Jet Pumps 4, 13, 14, 17, and 20 through U2C13 Fuel Cycle; no reportable indications. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 4 (additional scope) and 11 thru 20; previous indications on vessel-side set screw (Jet Pump 11) and shroud-side set screw (Jet Pump 12) observed with no changes, previous set screw gap on vessel-side set screw for Jet Pump 14 not observed, previous set screw gap on shroud-side set screw for Jet Pump 16 observed - gap is approximately 1/5 of a thread width.

	2005	UT, VT-1	Baseline (2005) per BWRVIP-41, -138: UT (newly-qualified technique) of holddown beam locations BB-1, BB-2, and BB-3 (Jet Pumps 1 thru 20) - no reportable indications. Reinspection (2005) per BWRVIP-41: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); wear noted on inlet-mixer wedge and restrainer bracket pad for Jet Pump Nos. 4, 7, 13, 14, 17 (the most severe), and 20. No additional wear noted since 2003 inspection. Wedge rod wear noted for Jet Pump Nos. 4, 8, 17, and 20. Dimensional problems with slip joint clamps prevented their scheduled installation on five (5) jet pumps. Qualitative Assessment justified continued operation of jet pumps through U2C14 Fuel Cycle. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified ten (10) set screw gaps ranging from 8 to 44 mils in width. One reportable linear indication identified on outboard shroud-side set screw tack weld for Jet Pump No. 12. Nine (9) auxiliary wedges installed on Jet Pumps 1, 2, 4, 5, 10, 12, 14, 16, and 20.
	2007	EVT-1, VT-1	Baseline (2007) per BWRVIP-41: EVT-1 of Medium Priority Locations RS-6 & RS-7 (Jet Pumps 1 thru 10), RS-8 & RS-9 (Jet Pumps 1, 2, 5 thru 10), IN-4, MX-2, & DF-1 (Jet Pumps 1 thru 10); no reportable indications. Reinspection (2007) per BWRVIP-41: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d (Jet Pumps 1 thru 6), RS-8 & RS-9 (Jet Pumps 3 & 4); no reportable indications. EVT-1 of High Priority Locations RS-1, RS-2, RS-3, DF-2, AD-1, AD-2, AD-3a, & AD-3b (Jet Pumps 1 thru 10); no reportable indications.

			VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); vibration-induced wear noted on inlet-mixer wedge and restrainer bracket pad for Jet Pump Nos. 3 (new) along with 4, 13, 14, 17, and 20 (existing but unchanged since 2003 inspection). Slip joint clamps installed on these six (6) jet pumps. Service-induced wear noted on inlet-mixer wedge for Jet Pump Nos. 4 (existing but unchanged since 2005 inspection) along with 5, 12, 16, and 19 (new). Minor rod wear observed for Jet Pump Nos. 3, 5, 13, & 15 (new) along with 4, 8, 17, & 20 (existing, but unchanged since 2005). VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified four (4) set screw gaps ranging from 7 to 12 mils in width. Vessel-side gap on Jet Pump 9 grew from 9 to 19 mils following attempts to reseat inlet-mixer. One reportable linear indication identified on inboard vessel - side set screw tack weld for Jet Pump No. 15. Nine (9) auxiliary wedges installed in 2005 inspected to verify contact; no reportable indications.
	2009	EVT-1, VT-1	Reinspection (2009) per BWRVIP-41, Rev. 1: VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); vibration-induced wear noted on inlet-mixer wedge and restrainer bracket pad for Jet Pump Nos. 7 and 18 (new) along with 3, 4, 13, 14, 17, and 20 (existing but unchanged from previous inspections). Slip joint clamps installed on Jet Pumps 7 and 18. Service-induced wear noted on inlet-mixer wedge for Jet Pump Nos. 5, 6, 8, 9, 10, 12, and 16. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified three (3) set screw gaps that exceeded the 15-mil criteria for installation of an auxiliary spring wedge.

			Auxiliary spring wedges installed on shroud-side set screw for Jet Pump No. 7 and the vessel-side set screw for Jet Pump Nos. 9 and 13. Three relevant weld indications were noted on the inboard vessel-side set screw tack welds for Jet Pump Nos. 11 (first identified during U2C7 Refueling Outage (RFO) in 1994), 13, and 15 (first identified during U2C13 RFO in 2005). Six (6) slip joint clamps installed in 2007 inspected to verify hardware remains as installed; no relevant indications. VT-3 visual examination of sensing line clamps installed during U2C14 RFO (2007) on Jet Pumps 1-5 and 11-15 performed to confirm that all of the repair hardware is in place and that the hardware has not shifted or changed from the as-installed condition. No relevant indications were observed.
	2011	UT, EVT-1, VT-1	Reinspection (2011) per BWRVIP-41 R3, -138 R1: UT of holddown beam locations BB-1 and BB-2, (Jet Pumps 1 thru 20) - no reportable indications. EVT-1 of Medium Priority Locations RS-8 and RS-9 (Jet Pumps 1 thru 20) performed in accordance with BWRVIP Letter No. 2009-202 ("Interim Guidance for Accelerated Inspections of Jet Pump Riser to Riser Brace Welds and Wedges"); no reportable indications. VT-1 of Medium Priority Location WD-1 (Jet Pumps 1 thru 20); no additional vibration-induced wear noted. VT-1 of Set Screw Locations AS-1 and AS-2 performed for Jet Pumps 1 thru 20. Backlighting identified two new set screw gaps, one of which (Jet Pump 18 Vessel-Side set screw (VS-SS)) exceeded the 15-mil criteria for installation of an auxiliary spring wedge. Justification for Continued Operation (JCO) was prepared and

			concluded that Jet Pump 18 is acceptable as-is for one fuel cycle. Two relevant weld indications were noted on the outboard VS-SS tack weld for Jet Pump 11 (first identified during Unit 2 Refueling Outage 7 (U2R7) in 1994) and the inboard VS-SS tack weld for Jet Pump 15 (first identified during U2R13 in 2005); indications were unchanged. VT-3 of two slip joint clamps and three auxiliary spring wedges installed in 2009 was performed to inspected to verify hardware remains as-installed; no relevant indications.
	2013	UT, EVT-1 VT-1	Reinspection per BWRVIP-41 R3: EVT-1 of Medium Priority Locations RB-1a-d, RB-2a-d, RS-6, & RS-7 (Jet Pumps (JPs) 11 thru 16), and IN-4 (JPs 11 thru 15); no reportable indications. EVT-1 of High Priority Locations RS-1, RS-2, & RS-3, (JPs 11 thru 20); no reportable indications. UT of Adapter/Diffuser Welds MX-2, AD-1, AD-2, DF-1, DF-2, & DF-3 (JPs 1 thru 20). Two indications (2.6" and 1.7") observed on downstream side of JP 7, Weld AD-1. One indication (1.6") observed on downstream side of JP 10, Weld DF-1. Indications evaluated in accordance with the Jet Pump Flaw Evaluation Handbook. Evaluation showed welds are acceptable as-is for three cycles. Welds will be reinspected during U2R20 (2019). VT-1 performed of Medium Priority Location WD-1 (JPs 1 thru 20); no new wear noted and no apparent changes in previously recorded wear/movement. VT-1 performed of Set Screw Locations AS-1 and AS-2 for JPs 1 thru 20. Backlighting identified four (4) set screw gaps (2 existing and 2 new) three of which ranged from 9 to 13 mils in width (below

			15-mil screening criteria). One set screw gap (JP 18 Vessel-Side Set Screw (VS-SS)) initially measured at 18 mils, but tapping of the main wedge was successful in reducing the gap to 8 mils. Therefore, no additional auxiliary wedges were required to be installed. Nine (9) auxiliary wedges installed during U2R13 (2005) reinspected to verify contact; no reportable indications. Two (2) existing set screw tack weld indications (JPs 11 & 15) observed but redundant tack weld still intact; no repair required. Reinspection per BWRVIP-41 R3:
	2015	EVT-1, VT-1	EVT-1 of High Priority Locations AD-3a and AD-3b (JPs 11 thru 20); no reportable indications. VT-1 performed of Medium Priority Location WD-1 (JPs 1 thru 20); no new wedge wear noted nor changes in previous wedge wear were observed. Six (6) slip joint clamps installed during U2R14 (2007) reinspected to verify hardware remains as installed; no relevant indications. VT-1 performed of Set Screw Location AS-1 for four locations (Vessel-Side Set Screw (VS-SS) for JPs 3, 4, 18, & 20) where set screw gaps were observed during U2R17 (2013). Backlighting identified that two of the gaps (JP 3 VS-SS: 27 mils, JP 18 VS-SS: 18 mils) initially exceeded the 15-mil screening criteria, but tapping of the main wedge was successful in reducing the gap to 12 mils and 11 mils respectively. Therefore, no additional auxiliary wedges were required to be installed. Two (2) existing set screw tack weld indications (VS-SS for JPs 11 & 15) observed but redundant tack weld still intact; no repair required.
	2017	UT	Reinspection (2017) per BWRVIP-41 R3, -138 R1-A: UT of holddown beam locations BB-1, BB-2, and BB-3, (Jet

			Pumps 1 thru 20) - no relevant indications observed.
		VT-1 VT-3	Reinspection (2017) per BWRVIP-41 R3: VT-1 performed of Medium Priority Location WD-1 (JPs 1 thru 20); no new wedge wear noted nor changes in previously wedge wear were observed. Two (2) slip joint clamps installed during U2R15 (2009) reinspected (VT-3) to verify hardware remains as installed; no relevant indications. Scope expanded to include all slip joint clamps (8 total) since during performance of a nearby exam wear was noticed on the diffuser and on the slip joint clamp for JP 20 at the mid-vane area. No relevant indications noted except for the slip joint clamp for JP 20. Clamp acceptable for one fuel cycle without a repair, but a replacement slip joint clamp is being procured for installation during U2R20 in 2019. VT-1 performed of Set Screw Location AS-1 for four locations (Vessel-Side Set Screw (VS-SS) for JPs 3, 4, 18, & 20) where set screw gaps were observed during U2R18 (2015). Backlighting identified that one of the gaps (JP 18 VS-SS: 22 mils) initially exceeded the 15-mil screening criteria, but tapping of the main wedge was successful in reducing the gap to 10 mils. Therefore, no additional auxiliary wedges were required to be installed. Three (3) auxiliary wedges installed during U2R15 (2009) reinspected (VT-1/VT-3) to verify contact; no relevant indications observed. Two (2) existing set screw tack weld indications (VS-SS for JPs 11 & 15) observed (VT-1) but redundant tack weld still intact; no repair required.
Jet Pump Diffuser	See Jet Pump Assembly	N/A	N/A
CRD Guide Tube	2005	EVT-1, VT-3	Baseline (2005) per BWRVIP-47: 10 control rod guide tubes examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual

			examination of Locations CRGT-2 and CRGT-3; no reportable indications.
	2007	EVT-1, VT-3	Baseline (2007) per BWRVIP-47: 3 control rod guide tubes examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual examination of Locations CRGT-2 and CRGT-3; no reportable indications.
	2009	EVT-1, VT-3	Baseline (2009) per BWRVIP-47: 3 control rod guide tubes examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual examination of Locations CRGT-2 and CRGT-3; no relevant indications.
	2011	EVT-1, VT-3	Baseline (2011) per BWRVIP-47: 3 control rod guide tubes examined. VT-3 visual examination of Locations CRGT-1 and FS/GT-ARPIN-1, EVT-1 visual examination of Locations CRGT-2 and CRGT-3; no relevant indications.
	2017	VT-3	General condition VT-3 of CRD Guide Tubes adjacent to Cell 46-31 performed due to an FME event; no relevant indications were noted.
CRD Stub Tube	N/A	N/A	A general area inspection was performed in 1991 while a jet pump was removed. The periphery stub tubes and housing were visible. No indications or abnormalities were noted.
	2017	VT-3	General condition VT-3 of CRD Stub Tubes adjacent to Cell 46-31 performed due to an FME event; no relevant indications were noted.
In-Core Housing	2017	VT-3	General condition VT-3 of In-Core Housings adjacent to Cell 46-31 performed due to an FME event; no relevant indications were noted.
Dry Tube	1994	VT	Dry tubes inspected during U2C7 Refueling Outage per the requirements of GE SIL No. 409. Cracking was observed; tubes replaced with modified design which is resistant to cracking during

			U2C7 Refueling Outage. Inspections will be scheduled after dry tubes have reached the expected 20-year life (2013).
	2013	EVT-1 VT-1	All 12 (4 SRM and 8 IRM) dry tubes inspected in accordance with GE SIL-409 R2; examined the upper two feet of the instrumentation from two locations or views 180 degrees apart looking for evidence of cracking and insuring proper seating into the Top Guide; no recordable indications noted.
	2015	VT-1	Four (4) IRM Dry Tubes (RPS B 24-29, RPS A 24-37, RPS A 32-29, & RPS B 32-37) were examined for engagement and integrity prior to being replaced proactively during U2R18 even though extrapolations of measurement between the plunger and the Top Guide indicated they would not fully disengage from the Top Guide during the next fuel cycle. The remaining eight (8) dry tubes (4 SRM and 4 IRM) were inspected in accordance with GEH SIL-409 R4. Three (3) IRM Dry Tubes (RPS B 16-13, RPS A 16-53, & RPS A 48-13) and four (4) SRM Dry Tubes (16-21, 16-45, 40-21, & 40-45) were not fully engaged into the Top Guide but extrapolations of measurement showed they would be functional for at least one fuel cycle without a repair. One (1) IRM Dry Tube (RPS B 48-53) was fully engaged into the Top Guide.
	2017	VT-1	Four (4) IRM Dry Tubes (RPS B 24-29, RPS A 24-37, RPS A 32-29, & RPS B 32-37) replaced during U2R18 (2015) were examined, and full plunger engagement into the Top Guide was confirmed. Four (4) SRM Dry Tubes (16-21, 16-45, 40-21, & 40-45) were examined for engagement and integrity prior to being replaced proactively during U2R19 even though extrapolations of measurement between the plunger and the Top Guide indicated they would not fully disengage

			from the Top Guide during the next fuel cycle. The remaining four (4) IRM Dry Tubes (RPS B 16-13, RPS A 16-53, RPS A 48-13, & RPS B 48-53) were inspected in accordance with GEH SIL-409 R5. All four dry tubes were not fully engaged into the Top Guide, but extrapolations of measurement showed they would be functional for at least one fuel cycle without a repair. Plans are in place to replace these four dry tubes during U2R20 in 2019. Baseline inspection per GEH SIL-409 R5 for LPRM at Location 16-57. Full plunger engagement into the Top Guide was confirmed.
Instrument Penetrations	2009	VT-2	Visual leak check is performed during each refueling outage. No reportable indications reported to date.
		UT	UT performed on RPV Instrument Nozzles N11A/B, N12A/B, and N16A/B in response to indication found on N11B safe end-to-pipe weld during U1C7 Refueling Outage. Flaw was found in N12A austenitic stainless steel safe end material approximately 0.5" from safe end-to-pipe weld. Full structural weld overlay was applied to maintain pressure boundary integrity.
	2011	VT-2	Visual leak check performed during U2R16. No reportable indications reported.
		UT	UT performed on RPV Instrument Nozzles N11A/B, N12B, and N16A/B (stainless steel safe end-to-pipe weld) and Nozzle N12A (weld overlay applied during U2R15 (2009)); no recordable indications noted.
	2013	VT-2	Visual leak check performed during U2R17. No reportable indications reported.

		UT	UT performed on RPV Instrument Nozzles N11A/B, N12B, and N16A/B (stainless steel safe end-to-pipe weld) and Nozzle N12A (weld overlay applied during U2R15 (2009)); no recordable indications noted.
	2015	VT-2	Visual leak check performed during U2R18. No reportable indications reported.
		UT	UT performed on RPV Instrument Nozzles N11A/B, N12B, and N16A/B (stainless steel safe end-to-pipe weld) and Nozzle N12A (weld overlay applied during U2R15 (2009)); no recordable indications noted.
	2017	VT-2	Visual leak check performed during U2R18. No relevant indications reported.
		UT	UT performed on RPV Instrument Nozzles N11A/B, N12B, and N16A/B (stainless steel safe end-to-pipe weld); no relevant indications noted.
Feedwater Sparger	1996	VT-1, VT-3	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; bent lower lip of third nozzle in from 235 degrees noted but acceptable as-is.
	2003	VT-1	Feedwater sparger nozzles examined (VT-1) per NUREG-0619; bent lower lip of third nozzle in from 235 degrees noted as unchanged and acceptable as-is. Sparger end brackets also examined with no reportable indications.
	2007	VT-3	Feedwater sparger nozzles examined per NUREG-0619; bent lower lip of third nozzle in from 235 degrees noted as unchanged and acceptable as-is. Pre-EPU inspection examination performed of all twelve (12) Feedwater Sparger End Brackets. Minor wear observed under the retaining pin for the end bracket at eight (8) locations. Qualitative assessment performed to accept-as-is for one cycle. Additional inspections during U2R15

			(2009) will be scheduled to determine the extent of any additional wear.
	2009	VT-3	Reinspection (2009): VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets. Minor wear observed under the retaining pin for the end bracket at eight (8) locations during the previous inspection in 2007 was unchanged. Qualitative assessment performed to accept-as-is for one cycle.
	2011	EVT-1, VT-1, VT-3	Reinspection (2011): Feedwater sparger nozzles examined (VT-1) per NUREG-0619; bent lower lip of third nozzle in from 235 degrees noted as unchanged and acceptable as-is. EVT-1 / VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets. Minor wear observed under the retaining pin for the end bracket at eight (8) locations during the previous inspection in 2009 was unchanged.
	2013	VT-3	Reinspection (2013): VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets. Minor wear observed under the retaining pin for the end bracket at seven (7) locations during the previous inspection in 2011 was unchanged. Also, the end bracket pin at 175 degrees that was seated during U2R16 and is now slightly elevated during U2R17 but no wear was observed under the pin. Additional inspections during U2R18 (2015) will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation. Also, the feedwater sparger nozzle (third nozzle in from 235 degrees) with the bent lower lip was observed during the nozzle examinations of the Nozzle Penetrations at N4-B-90 and noted to be unchanged.

	2015	VT-3	Reinspection (2015): VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets. Minor wear observed under the retaining pin for the end bracket at seven (7) locations during the previous inspection in 2013 (U2R17) was unchanged. Also, the end bracket pin at 175 degrees that was slightly elevated during U2R17 with no wear has moved down in U2R18. Additional inspections during U2R19 (2017) will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation.
	2017	VT-3	Reinspection (2017): VT-3 visual examination performed of all twelve (12) Feedwater Sparger End Brackets. Minor wear observed under the retaining pin for the end bracket at seven (7) locations during the previous inspection in 2015 (U2R18) was unchanged, although during U2R19 no wear was noted on the bracket at the 125° location and very minor wear was noted on the bracket at the 175° location. Additional inspections during U2R20 (2019) will be scheduled to determine the extent of any additional wear. A contingency modification will also be developed in the event that the inspection results dictate that repair of any end brackets is required for continued operation.
Vessel ID Brackets	1996	VT-1, VT-3	Jet Pump Riser Brace Welds (20) examined (VT-1). Also, Core Spray Piping Brackets (8) examined (VT-3); no recordable indications.
	1997	VT-1, MVT-1	Jet Pump Riser Brace Welds (20) examined (VT-1). Also, Core Spray Piping Brackets (8) examined (MVT-1); no recordable indications.
	1999	EVT-1, VT-3	Core Spray Piping Brackets (8) examined (EVT-1). Also, Steam Dryer Support Brackets (4) and Feedwater Sparger

			Brackets (12) examined (VT-3); no recordable indications.
	2001	EVT-1	Jet Pump Riser Brace Welds (40) examined; no recordable indications.
	2003	EVT-1	Jet Pump Riser Brace Welds (16) examined; no recordable indications.
	2007	EVT-1	Jet Pump Riser Brace Welds (12), Core Spray Piping Brackets (8), and Feedwater Sparger Brackets (12) examined; no recordable indications.
	2011	VT-3	Steam Dryer Support Brackets (4) examined; no recordable indications.
	2013	EVT-1	Steam Dryer Support Brackets (4) examined; no recordable indications.
	2015	EVT-1	Core Spray Piping Brackets (8) examined, see Core Spray Piping results for information on cracked tack weld between the bolt threads & lower stud of the bracket @ 165 degrees. Otherwise, no relevant indications.
LPCI Coupling	N/A	N/A	Not applicable to this plant
Steam Dryer	1989	VT-3	(1989): During Unit 2 Restart, cracking was found in 3 of 8 Unit 2 Steam Dryer Drain Channel to Skirt Attachment Welds. Repair of the cracked welds and reinforcement of all 8 welds for future mitigation performed.
	1994	VT-3	(1994): Welds associated with Drain Channel #4 (Azimuth 310°) visually inspected (VT-3) in accordance with vendor requirements. No reportable indications were noted.
	1997	VT-1, VT-3	(1997): Welds associated with Drain Channel #1 (Azimuth 50°) were visually inspected (VT-3) in accordance with vendor requirements. No reportable indications were noted.
	2001	VT-1, VT-3	(2001): Welds associated with Drain Channel #2 (Azimuth 130°) were visually inspected (VT-3) in accordance with

			vendor requirements. No reportable indications were noted.
	2005	VT-1, VT-3	(2005): The following locations were visually inspected (VT-1) in accordance with BWRVIP-139 and GE SIL 644 R1: • Horizontal and vertical welds which outline the steam dryer outer bank • Cover plate between the outer hood vertical plate and the support ring • Weld seams associated with the outer side of the inner banks • Dryer manway @ 90° No reportable indications were noted. • Stabilizer/Tie Bars - Deformation noted on center tie bars between Banks 3 & 4: All 3 locations (0°, center, 180°). Evaluation performed to accept-as-is for next fuel cycle (U2C14 Fuel Cycle), which is the final fuel cycle prior to Extended Power Uprate (EPU) implementation. The following locations were inspected in accordance with INPO OE: • Leveling screw tack welds @ 5° & 185° - No reportable indications were noted. • Dryer surfaces - Light to heavy Noble Metal coating observed in many areas, some with flaking (NRI). Also, a metal abrasion was noted above the lower guide bracket (NRI). Welds associated with Drain Channel #3 (Azimuth 230°) visually inspected (VT-3) i.a.w. vendor requirements. No reportable indications were noted.
	2007	VT-1	Stabilizer/Tie Bars - No apparent change to deformation noted on center tie bars between Banks 3 & 4: All 3 locations (0°, center, 180°). Small deformation noted for Tie Bar 4/5-1. In addition, the Dryer Center Bank Divider was observed to be bent. Evaluation performed to accept-as-is until Extended Power Uprate (EPU) implementation. Pre-EPU inspection of Steam Separator Standpipe Welds performed to look for

			fatigue cracking; no reportable indications. Pre-EPU inspection of all 48 Shroud Head Bolts performed to look for wear in locking pin window and on mid-span and top support ring gussets; no reportable indications.
	2009	VT-1, VT-3	(2009): The "green" weld locations (locations associated with field cracking throughout the BWR fleet) were visually inspected (VT-1) in accordance with BWRVIP-139. 9 anomalies were identified: • 3 tie bars severed at one end (TBs-3/4-01, -02, & -03) • TB-4/5-02 contained an indication on the SE end of the bar in the weld • 4 tie bars were slightly bowed (TBs-1/2-01, -02, 5/6-01, -02) • Center Divider (Baffle) Plate between Banks 3 and 4 was deformed Weld was repaired for TB-4/5-02 and seven (7) broken/damaged tie bars replaced with EPU-qualified replacements. Scope was expanded to visually inspect (VT-1) all "red" weld locations (locations important to dryer integrity) in accordance with BWRVIP-139. In addition, high stress weld locations as identified in the steam dryer analysis for EPU were VT-1 inspected as well as locations subject to load increase once the center tie bars failed (due to vane bank displacement). During the course of these additional scope exams, three vertical welds (2V01, 2V10, and 5V10) on the ends of the 3/8-inch plate attached to the vane bank dryer units were found to have no weld metal present for approximately six inches at the top of the welds. These three welds were repaired and restored to their original design condition. All repairs will be inspected during the U2C16 RFO in 2011 to ensure that

			structural integrity of the dryer is maintained. Additionally, any original tie bars that have not yet been replaced will be replaced during the U2C16 RFO in preparation for initiation of EPU operation during the U2C17 Fuel Cycle. Dryer Drain Channel Welds associated with Drain Channels 1-4 and Dryer Manway Cover were VT-1 inspected in accordance with BWRVIP-139. No relevant indications were observed. Seismic Lugs at 90 and 270 degrees were VT-3 inspected for general overall condition. No relevant indications were observed. The following locations were inspected in accordance with INPO OE: • Leveling screw tack welds at 5 and 185 degrees were VT-1 inspected - No relevant indications noted. • Dryer hood exterior surfaces above the support ring were VT-3 inspected - light to heavy scale deposits found.
	2011	VT-1	(2011): Three areas (Welds B2V-01, B2V-10, B5V-10) that were repaired during U2R15 (2009) and seven Upper Bank Tie Bars (TB-1/2-01, -02, TB-3/4-01, -02, -03, TB-5/6-01, and -02) that were replaced during U2R15 (2009) were examined with no evidence of change. The six remaining original Upper Bank Tie Bars (TB-2/3-01, -02, -03, TB-4/5-01, -02, and -03) showed signs of distortion. An evaluation was performed to accept these tie bars as-is for one cycle of operation. These six original tie bars will be re-examined during U2R17 (2013). In the event of additional distortion and/or damage, a contingency plan will be in place to replace these original tie bars with EPU-qualified tie bars.
	2013	VT-1	(2013): The six remaining original Upper Bank Tie Bars (TB-2/3-01, -02, -03, TB-4/5-01, -02, and -03) again showed signs of distortion but this distortion was unchanged from that observed in U2R16.

			Therefore, the conclusion reached in the U2R16 evaluation is still valid. These six original tie bars will be re-examined during U2R18 (2015). In the event of additional distortion and/or damage, a contingency plan will be in place to replace these original tie bars with EPU-qualified tie bars.
		VT-1	Dryer Drain Channel Welds associated with Drain Channels #1 were VT-1 inspected in accordance with BWRVIP-139-A. No relevant indications were observed.
		VT-3	A supplemental general overview of the Steam Dryer (support ring to the top 360 degrees around, the valleys between the banks, and the lower portion of the dryer skirt around the complete circumference) was performed due to moisture carryover concerns. No evidence of degradation was observed. Also, dryer oxide build-up was noted and shows no change from U2R16 data.
	2015	VT-1	(2015): The six remaining original Upper Bank Tie Bars (TB-2/3-01, -02, -03, TB-4/5-01, -02, and -03) showed an increase in distortion when compared to U2R17 data, but none exceeded the deflection value (0.324 inches) that corresponds to the threshold stress level (endurance limit) of 27,200 psi. Therefore, the conclusion reached in the U2R16 evaluation is still valid. These six original tie bars will be re-examined during U2R19 (2017). In the event of additional distortion and/or damage, a contingency plan will be in place to replace these original tie bars with EPU-qualified tie bars.
	2017	VT-1	(2017): The six remaining original Upper Bank Tie Bars (TB-2/3-01, -02, -03, TB-4/5-01, -02, and -03) showed an increase in distortion when compared to U2R18 data, and two tie bars (TB-2/3-02 and TB-4/5-02) exceeded the deflection value (0.324 inches) that corresponds to the

			threshold stress level (endurance limit) of 27,200 psi. An evaluation was performed by an outside vendor (SIA) that concluded the tie bars may be left in-service without a repair for one fuel cycle. If TVA decides not to replace the steam dryer assembly during the next refueling outage (U2R20), either a contingency plan will be in place to replace these original tie bars with EPU-qualified tie bars or a quantitative evaluation of the tie bar assemblies will be performed to develop a more accurate distortion acceptance criterion.
		VT-1	Dryer Drain Channel Welds associated with Drain Channel #2 were VT-1 inspected in accordance with BWRVIP-139-A. No relevant indications were observed.
		VT-3/VT-1	An overview of the Steam Dryer surfaces (70° & 110° Anomaly above the support ring on Bank 1 and 250° & 290° Anomaly above the support ring on Bank 6) was performed to examine the dryer surfaces. No relevant indications were observed.
Steam Separator	2011	VT-3	Steam Separator tie bars (cross bracing) examined for signs of cracking (Reference: INPO OE 30657). No relevant indications were observed on the cross bracing.
	2013	VT-3	Supplement general visuals of Steam Separator components (all four lifting lugs, the lower portions of Shroud Head Bolts 38 through 41, and Shroud Locking Lugs 37 to 41) were performed due to moisture carryover concerns. No evidence of degradation was observed.
	2015	EVT-1	During inspection of Core Spray Piping Weld DP8a during U2R18, distortion with evidence of wear was noted on the bottom outside edge of Shroud Head Lug #96, which is associated with Shroud Head Bolt #48. Per engineering evaluation the

			indication is acceptable as-is with no repair required.
DM Welds - BWRVIP-75-A Cat. C	2009	N/A	No Cat. C DM Welds were inspected during Unit 2 Refueling Outage 15 (U2R15).
	2011	N/A	No. Cat. C DM Welds were inspected during Unit 2 Refueling Outage 16 (U2R16).
	2013	N/A	No Cat. C DM Welds were inspected during Unit 2 Refueling Outage 17 (U2R17).
	2015	N/A	No Cat. C DM Welds were inspected during Unit 2 Refueling Outage 18 (U2R18).
	2017	N/A	No Cat. C DM Welds were inspected during Unit 2 Refueling Outage 19 (U2R19).
DM Welds - BWRVIP-75-A Cat. D	2009	N/A	No Cat. D DM Welds were inspected during Unit 2 Refueling Outage 15 (U2R15).
	2011	UT	2 welds inspected (DRHR-2-11, RCRD-2-50): PDI-qualified, automated exams. No flaws identified, no repairs.
	2013	UT	3 welds inspected (CRD-2-005-003, RCRD-2-49, RCRD-2-50): PDI-qualified, manual exams. No flaws identified, no repairs.
	2015	UT	2 welds inspected (RWCU-2-003-027, RWCU-2-003-044): PDI-qualified, manual exams. No flaws identified, no repairs.
	2017	UT	2 welds inspected (DRHR-2-11, RCRD-2-33): PDI-qualified, manual exams. No flaws identified, no repairs.

Reactor Internals Inspection History

Plant: **Brunswick Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud	1993	EVT-1 and UT	EVT-1 baseline, except UT on H4. Installed pre-emptive clamp repair on H2/H3. Indications in several circumferential welds. Full structural margins on non-repaired welds.
	1995	UT	UT re-inspected H4 with no growth in indications. UT baseline H1, H6A, H6B and H7. Several indications noted with full structural margins maintained. VT-1 and VT-3 inspected 3 repair brackets with no indications noted.
	1997	UT	UT re-inspected H4 and H6B (lower) with no growth in indications noted. Full structural margins maintained. UT baseline H5 with no indications noted. VT-1 and VT-3 inspected 3 repair brackets with no indications noted.
	1999	UT/EVT-1	UT re-inspected H1, H4 and H6B with no growth in indications noted. Full structural margins maintained. EVT vertical welds V3, V4, V5, and V6 with no indications. VT-1 and VT-3 inspected 3 repair brackets with no indications noted.
	2001	UT/EVT-1	UT re-inspected 100% of H6b and two selected areas of H4. Problems were encountered with lift-off of the UT package. The inspection data is still under investigation. EVT-1 of OD of vertical welds V9, V10, and V11 with no indications noted. VT-1/VT-3 inspected 3 repair clamps with no indications noted.
	2003	EVT-1	EVT-1 of vertical welds V1 and V2. No indications noted.

		VT-1/VT-3	VT-1/VT-3 of shroud repair clamps SRB225, SRB255, SRB285, and SRB315. No indications noted.
	2005	VT-1/VT-3	Four of 12 Shroud repair brackets SRB105, SRB135, SRB165, and SRB195. No indications noted.
		UT	H1 Upper - Deferred H1 Lower 61.2% examined H4 Upper 94.2% examined H4 Lower 89.7% examined H6a Upper 75% examined H6a Lower 67.1% examined H7 Upper & Lower Deferred No significant growth of existing cracks or new cracking noted.
	2007	UT	H1 upper – 95% examined – 2% flawed H5 – 100% examined – 0% flawed H6b – 99% examined – 59% flawed – average flaw depth is 0.12" H7 – 83% examined – 3% flawed No growth noted.
		VT-1/VT-3	4 of the 12 Core Shroud repair clamps for H2&H3. No indications.
		EVT-1	V9, V10, V11 – one side only. ID is inaccessible. No indications.
	2009	VT-1/VT-3	4 of the 12 Core Shroud repair clamps for H2&H3. NRI
		EVT-1	(V1,V2)-OD,(V3,V4, & V6)-OD & ID 1 RI on V2, 5 RI's on V6 all < 10%
	2011	VT-1/VT-3	4 of the 12 Core Shroud repair clamps for H2&H3. NRI
	2013	UT	Inspected via UT for: H1, H4, H6a, H6b, V1, V2, V5, V7, V8, V9, V11.
		EVT-1	V10 with EVT-1 OD, and supplemental visual for V7, V9 & V11 in areas UT could not access OD.
	2015	VT-1/VT-3	4 of the 12 Core Shroud Repair Clamps (for welds H2 & H3) (NRI)
	2017	VT-3/VT-1	Shroud Repair Clamps 4 of 12 - NRI

		UT	Circumferential Welds H4, H5, H6a, H6b and H7 and Vertical Welds V1-V11 were UT examined in accordance with BWRVIP-03, Rev. 19 approved UT technique for both IGSCC indications parallel to welds (BWRVIP-76, Rev. 1-A) and off-axis cracking as described in Interim Guidance 2016-030. Scanning for off-axis flaws were performed on H4, H5 and V5 – V8, which were within the requirements of the interim guidance. Results are summarized as follows: BWRVIP-76, Rev. 1-A Exams: V1(CW) 84.3% coverage: NRI V1(CCW) 56.25% coverage: NRI V2(CW) 85.0% coverage: NRI V2(CCW) 54.38% coverage: NRI V3(CW) 34.17% coverage: NRI V3(CCW) 41.67% coverage: 3.61% flawed V4(CW) 45.83% coverage: 1.11% flawed V4(CCW) 41.67% coverage: NRI H4(upper) 92.66% coverage:13.45% flawed H4(lower) 92.66% coverage:38.49% flawed V5(CW) 66.5% coverage: 1.84% flawed V5(CCW) 66.5% coverage: 0.0% flawed V6(CW) 69.3% coverage: 12.35% flawed V6(CCW) 70.31% coverage: 0.0% flawed H5(upper) 92.66% coverage: 0.1% flawed H5(lower) 92.66% coverage: 0.3% flawed V7(CW) 86.11% coverage: 0.0% flawed V7(CCW) 86.11% coverage: 0.0% flawed V8(CW) 86.11% coverage: 0.0% flawed V8(CCW) 88.89% coverage: 0.0% flawed H6a(upper) 92.66% coverage: 7.3% flawed H6a(lower) 92.66% coverage: 0.0% flawed H6b(upper) 92.66% coverage: 0.0% flawed H6b(lower) 92.66% coverage: 43.5% flawed V9(CW) 46.1% coverage: 0.0% flawed V9(CCW) 46.1% coverage: 0.0% flawed V10(CW) 92.20% coverage: 0.0% flawed V10(CCW) 92.28% coverage: 0.0% flawed V11(CW) 34.58% coverage: 0.0% flawed V11(CCW) 34.58% coverage: 0.0% flawed H7(upper) 52.63% coverage: 7.8% flawed H7(lower) 52.63% coverage: 0.0% flawed

			Off-Axis Cracking Interim Guidance 2016-030: H4(upper) 27.9% coverage: 8 indications # of Through-Wall Indications: 3. All Relevant Indications are < 4" H4(lower) 27.9% coverage: 3indications # of Through-Wall Indications: 3. All Relevant Indications are < 4" V5(CW) 66.53% coverage: 1 indication # of Through-Wall Indications: 0. All Relevant Indications are < 4" V5(CCW) 66.53% coverage: NRI. V6(CW) 70.31% coverage: 1 indication # of Through-Wall Indications: 0. Relevant Indication is < 4" V6(CCW) 69.3% coverage: 5 indications # of Through-Wall Indications: 2. All Relevant Indications are < 4" H5(upper) 18.6% coverage: 7 indications # of Through-Wall Indications: 3. All Relevant Indications are < 4" H5(lower) 18.6% coverage: 7 indications # of Through-Wall Indications: 1. A All Relevant Indications are < 4" V7(CW) 50.0% coverage: NRI V7(CCW) 50.0% coverage: 1 indication # of Through-Wall Indications: 0. Relevant Indication is < 4" V8(CW) 91.67% coverage: NRI. V8(CCW) 50.0% coverage: 1 indication # of Through-Wall Indications: 0. 1 indication > 4 inches (l=6.46", d= 0.33")
Shroud Support	1994	EVT-1	VT-1 of access cover welds inspected - no indications noted.
	1996	UT	H9 inspected with no indication noted.
	1991 and 1994	UT	Access hole covers UT's for radial and circumferential indications with no indications noted.
	1999	N/A	No inspections performed.
	2001	N/A	No inspections performed.

	2003	EVT-1	EVT-1 of both access hole covers. No indications noted.
	2005	UT	H9 ~ 60% examined, One relevant indication noted.
	2007	EVT-1	H8 & H9 at 0 & 180 deg Access Hole Covers at 0 and 180 deg No indications noted.
	2009	N/A	No inspections performed this outage.
	2011	EVT-1	H8 & H9 at 0 & 180 deg Access Hole Covers at 0 and 180 deg NRI.
	2013	N/A	No inspections this outage
	2015	EVT-1 UT	H8 @ 0 & 180 degrees (NRI) H9 UT Phased Array performed from vessel OD, ~40% Coverage (NRI)
Core Spray Piping	1980's to Present	MVT-1 and EVT-1	IEB 80-13 of piping and welds in annulus. One indication on annulus header piping at the header to T-Box weld. Welded brackets installed 1991with full structural margins maintained. First inspected per BWRVIP-18 in Fall 1996 with no new indications found. Re-inspected per BWRVIP-18 in Fall 1997 with no new indications found.
	1999	EVT-1	Performed inspections of selected core spray annulus piping welds in accordance with BWRVIP-18 with no new indications noted.
	2001	EVT-1	Performed inspections of selected core spray annulus piping welds in accordance with BWRVIP-18 with no new indications noted.
	2003	EVT-1	EVT-1 inspection of all P1, P2, P3, P5, P6, P7, P8a and P8b welds, 25% of P4 welds, 25% of piping bracket welds, and 100% of existing repairs. No indications noted.

	2005	EVT-1	Inspection of all P1, P2, P5, P6, P7, P11, P12, P8a and P8b welds and P3 @ 270 degrees, 25% of P4 welds, 25% of piping bracket welds, and 100% of existing repairs. No indications noted.
	2007	EVT-1	Inspection of all P1, P2, P5, P6, P7, P11, P12, P8a and P8b welds and P3 @ 270 degrees, 25% of P4 welds, 25% of piping bracket welds, and 100% of existing repairs. No indications noted.
	2009	EVT-1	Inspection of all P1, P2, P5, P6, P7, P11, P12, P8a, P8b, P3's@270. 25% of P4 welds, 25% of piping bracket welds. Repair bracket welds on 90 deg T Box found flaws near the end of the T-Box. May come from creviced weld P2. UT not possible.
	2011	EVT-1	Inspection of all P1, P2, P5, P6, P7, P11, P12, P8a, P8b, P3's@270, 25% of P4 welds, 25% of piping bracket welds (PB-150). NRI. 90 deg Repair bracket T-Box flaws showed no growth.
	2013	EVT-1	Inspection of all P1, P2, P5, P6, P7, P11, P12, P8a, P8b, P3's@270, 25% of P4 welds, 25% of piping bracket welds (PB-210). NRI. 90 deg Repair bracket (Batwing) T-Box flaws showed no growth. 2 additional minor flaws detected most likely from better cleaning – still plenty of margin. RI
	2015	EVT-1	Inspection of all P1, P2, P5, P6, P7, P11, P12, P8a, P8b, P3's@270, 25% of P4 welds, 25% of piping bracket welds (PB-330). NRI. 90 deg Repair bracket (Batwing) T-Box flaws showed no growth. Repair has 12 welds P3BR-01 thru 12. (RI on 2 of them)
	2017	EVT-1	Core Spray Piping (17 inspections) Piping A Loop Inspections include: Core Spray Piping Bracket: PB-30 (NRI) Core Spray Piping Tee Box Repair: P3BR-01(NRI), P3BR-02(NRI), P3BR-03(RI→NRI, previous RI-no change),

			P3BR-04(NRI), P3BR-05(NRI),P3BR-06(NRI), P3BR-07(NRI), P3BR-08(NRI), P3BR-09(previous RI-no change), P3BR-10(NRI), P3BR-11(NRI), P3BR-12(NRI), Core Spray Piping Elbow Welds: P4a-10(NRI), P4b-10(NRI), P4c-10(NRI), P4d-10(NRI).
Core Spray Sparger	1980's to Present	MVT-1, EVT-1, and VT-3	IEB 80-13 of welds on sparger. One indication in sparger to tee weld. Bolted clamp installed in 1982 and full structural margin maintained. One small indication noted in and near the heat affected zone of Core Spray sparger support bracket to shroud plate weld. Structural integrity of the support maintained. First inspected per BWRVIP-18 in Fall 1996 with no new indications found. Re-inspected per BWRVIP-18 in Fall 1997 with no new indications found.
	1999	Per BWRVIP-18	Inspected spargers per BWRVIP-18 with no new indications noted and no change in previously identified indications.
	2001	Per BWRVIP-18	Inspected spargers per BWRVIP-18 with no new indications noted.
	2003	EVT-1/ VT-1	Inspected 7 Core Spray Sparger brackets and 25% of the sparger welds. No indications noted.
	2005	EVT-1/ VT-1	Inspected 25% of the Sparger welds and 5 sparger brackets. Tee Repair bracket also inspected. No indications noted.
	2007	EVT-1/ VT-1	Inspected 25% of the Sparger welds and 5 sparger brackets. Tee Repair bracket also inspected. No indications noted.
	2009	EVT-1/ VT-1	Inspected all S1, 25% of S2, S4, S3, and SD welds and 5 sparger brackets. No indications noted.
	2011	EVT-1/ VT-1	Inspected all S1 welds, 25% of S2, S3, S4, and SD welds and 5 sparger brackets. NRI.

	2013	EVT-1/ VT-1	Inspected all S1 welds, 25% of S2, S3, S4, and SD welds and 5 sparger support brackets. NRI.
	2015	EVT-1 VT-1/VT-3 EVT-1 VT-1 VT-1	8 of 14 S2, S4 welds (NRI) One repair Bracket at 170 deg,(SRC-170) SD weld @ 190 (NRI) 5 sparger support brackets (211, 241, 270, 299, 330). (NRI) 52 Sparger Nozzles for 350 deg. Sparger (NRI)
	2017	VT-3	Core Spray Spargers (2 inspections) A Loop : SN10-02a-53a(NRI) B Loop: SD190-2(NRI)
Top Guide (Rim, etc.)	1991-96	MVT-1, VT-3	Examined 2 cells in 1992 with no indications noted. 15 cells examined in 1995 with no indications noted. Did VT-3 of top guide hold downs examined in 1996 with no indications noted.
	1999	N/A	No inspections performed.
	2001	N/A	Inspected 50% of the top guide hold down latches with no discrepancies noted.
	2003	VT-1	Inspected 50% of the top guide hold down latches. No indications noted.
	2005	VT-1	No Top Guide grid beams were inspected this outage.
	2007	VT-1 EVT-1	Two hold-down latches Two Grid Beam Intersections in conjunction with Dry Tubes (SIL-409) No indications noted
	2009	EVT-1/ VT-1	2 hold-down latches 3 cells - grid beams lower 2" & intersection. No Indications noted.
	2011	N/A	No top guide inspections were performed this outage. Will expand scope next outage to meet criteria.
	2013	EVT-1/ VT-1	2 hold-down latches 7 cells - grid beams lower 2" & intersections. NRI

	2015	EVT-1	Two grid cells (NRI)
	2017	N/A	No top guide inspections in B223R1.
Core Plate (Rim, etc.)	1993	VT-1	Hold down bolts from topside and partial surface areas. No indications noted.
	1999	UT	UT from shroud outside surface to detect bolting presence. Detected presence of 56 bolts out of a minimum needed of 54 with no discrepancies noted.
	2001	UT	UT from shroud outside surface to detect bolting presence. Detected presence of all 72 bolts with no discrepancies noted.
	2003	N/A	No inspections performed on Core Plate.
	2005	N/A	No inspection performed on Core Plate bolts this outage.
	2007	UT	UT from shroud outside surface to detect bolting presence. Detected presence of all 72 bolts with no discrepancies noted.
	2009	N/A	No inspections performed this outage.
	2011	N/A	No inspections performed this outage.
	2013	UT	UT from shroud outside ring surface to detect bolting presence. Detected presence of 55 of the 72 bolts. Limited coverage due to tooling problems.
	2015	N/A	No inspections performed this outage.
	2017	UT	UT from shroud outside surface to detect bolting presence using Automated Phased Array Ultrasonic Examination. Detected presence of all 72 bolts with no discrepancies noted.
SLC	1988	LP	No exams performed on internal piping. Section XI LP performed on nozzle to safe end welds in 1988 with no indications noted.
	2001	N/A	No inspections performed.

	2003	VT-2	Enhanced leakage examination performed on nozzle-to-safe end weld. No leakage noted.
	2005	VT-2	Enhanced leakage examination performed on nozzle-to-safe end weld. No leakage noted.
	2007	VT-2	Enhanced leakage examination performed on nozzle-to-safe end weld. No leakage noted.
	2009	VT-2	Enhanced leakage examination performed on nozzle-to-safe end weld. No leakage noted.
	2011	VT-2	Enhanced leakage examination performed on nozzle-to-safe end weld. No leakage noted.
	2013	VT-2	Enhanced leakage examination performed on nozzle-to-safe end weld. No leakage noted.
	2015	VT-2	Enhanced leakage examination performed on nozzle-to-safe end weld. No leakage noted.
	2017	VT-2	Enhanced leakage examination performed on nozzle-to-safe end weld. No leakage noted.
Jet Pump Assembly	to present	VT-1 and VT-3	Riser brace brackets done once per period. Wedges, set screws, tack welds, sensing lines and sensing line supports VT per various SILs. Latest inspected in 1996 with no indications noted. Jet pump beams replaced in 1993. No indications noted, as well as in old jet pump beams.
	1997	VT-1 and VT-3	MVT-1 of Riser welds and tailpipe welds on 5 Jet Pump Pairs with no indications noted.
	1999	EVT-1/ MVT-1/ VT-1/VT-3	Performed inspections on 30 Riser welds, and 50% of the miscellaneous riser brace, inlet mixer, etc. welds. No indications noted.

	2001	EVT1/ VT-1	Performed inspections on representative samples of riser pipe to restrainer bracket circ. welds (RS-6, RS-7), riser pipe to primary riser brace circ. welds (RS-8, RS-9), barrel to adapter welds (MX-2), wedge bearing surfaces (WD-1), connections between inlet and mixer sections (IN-4), primary riser brace leaf to vessel pad welds (RB-1), and primary brace leaf to yoke welds (RB-2). No recordable indications noted.
	2003	EVT-1	EVT-1 of accessible areas of all 20 jet pump beams. No indications noted.
	2005	UT	Examined 100% of BB-1, BB2, & BB-3 Type 2 Beams (20). No indications noted.
		VT-1	Examined 10 WD-1 locations. No indications noted.
		EVT-1	Examined 4 IN-4 welds, 4 MX-2 welds, 1 Riser Brace, 2 RS-1, 2 RS-1a, 2 RS-2, 2 RS-3, and 1 RS-6, 1 RS-7, 1 RS-8, 1 RS-9: No indications noted.
	2007	UT	Examined 100% of BB-1, BB2, & BB-3 Type 2 Beams (20). No indications noted.
		VT-1	Examined 20 WD-1 locations. No indications noted.
		EVT-1	Examined 4 IN-4 welds, 4 MX-2 welds, 1 Riser Brace, 4 RS-1, 4 RS-1a, 2 RS-2, 2 RS-3, and 1 RS-6, 1 RS-7, 1 RS-8, 1 RS-9: No indications noted.
	2009	EVT-1	2 IN-4, 2 MX-2, 2 WD-1, <u>All</u> RS-1,1a, RS-8 & RS-9 welds. JPC Riser Brace & JPK RB-1a-d welds. 3 Flaws found in HAZ of JPC RS-1 weld, elbow side. Analysis good for two cycles. No other indications noted.
	2011	EVT-1	2 IN-4, 2 MX-2, 2 WD-1, 4 RS-1, 1 RS-1a, 1 RS-8&9 welds, 3 Flaws re-identified in HAZ of JPC RS-1 weld, elbow side. Analysis good for two cycles. No growth in indications noted. 2 RS-2, 2 RS-3, 1 RS-6&7, 23 Riser Brace welds

			NRI.
	2013	EVT-1	JP Riser Elbow "C", 3 flaws previously identified (RS-1), 1 flaw is now NRI. (Crud Line Removed by better cleaning). Other 2 flaws show no growth. 4-RB2, 6-RS-1, 2-RS-1a, 3-RS-2, 3-RS-3, 1-RS-6, 7, 8, 9. NRI
	2015	EVT-1	JPCRS-1 only 1 previous flaw. (RI) JPERS-1 (NRI) JP(3,4,5)IN-4 & JP(3,4,5)MX-2 (NRI) JPERS-6, 7, 8, 9 (NRI) JPERB-1a-1d (NRI) JPERB-2a-2d (NRI) JPARB-1a-1d (NRI)
		VT-1	JP(3,4,5)WD-1 (NRI)
	2017	VT-3	Jet Pumps 1, 6, 7, 13: JP01-IMT(NRI), JP06-IMT(NRI), JP07-IMT(NRI), JP13-IMT(NRI)
		VT-1	Jet Pumps 6, 7: JP06-WD-1(NRI), JP07-WD-1(NRI)
		VT-1/VT-3	Jet Pumps 11, 20: JP11-SL(NRI), JP20-SL(NRI)
		EVT-1	Jet Pump Risers A, B, C, G: JPARS-2(NRI), JPARS-3(NRI),JPBRS-1(NRI), JPBRS-1a(NRI), JPBRS-2(NRI), JPBRS-3(NRI), JPCRS-1(previous RI no change), JPCRS-1a(NRI), JPGRB-2a(NRI), JPGRB-2b(NRI), JPGRB-2c(NRI), JPGRB-2d(NRI), JPGRS-6(NRI), JPGRS-7(NRI), JPGRS-8(NRI), JPGRS-9(NRI)
Jet Pump Diffuser	to present	VT-3	Adapter and diffuser welds inspected once per period with no indications noted.
	1999	EVT-1	Inspected 50% of welds with no indications noted.
	2001	N/A	No inspections performed.
	2003	EVT-1	EVT-1 of AD-1, AD-2, and AD-4 welds on 10 jet pumps. No indications noted.
	2005	EVT-1	6 DF welds, 8 AD welds, no indications noted.

	2007	EVT-1 VT-1	4 AD-1, 4 AD-2, 2 DF-1, 4 DF-2 No relevant indications noted. Jet Pump sensing lines. No Relevant Indications noted.
	2009	EVT-1	2 DF-2, 1 DF-1, 2 AD-1, 2 AD-2, No relevant indications noted.
	2011	EVT-1	4 DF-2, 2 DF-1, 4 AD-1, 4 AD-2, NRI.
	2013	EVT-1	3-DF-1, 6-DF-2 NRI 2-JP sensing lines NRI
	2015	EVT-1	JP(5-10)AD-1 (NRI) JP(5-10)AD-2 (NRI) JP01-SL, JP10-SL (NRI) (sensing lines)
	2017	EVT-1	Jet Pumps 1,2,3,4,6,7,11,12,13,14,20: JP01-DF-1(NRI), JP01-DF-2(NRI), JP02-DF-1(NRI), JP02-DF-2(NRI), JP03-DF-2(NRI), JP04-DF-2(NRI), JP06-IN-4(NRI), JP06-MX-2(NRI), JP07-IN-4(NRI), JP07-MX-2(NRI), JP11-AD-1(NRI), JP11-AD-2(RI for debris), JP12-AD-1(NRI), JP12-AD-2(NRI), JP13-AD-1(NRI), JP13-AD-2(NRI), JP14-AD-1(NRI), JP14-AD-2(NRI).
CRD Guide Tube		VT-3	Access has not become available.
	2001	EVT-1/ VT-3	Performed inspections on 5% of CRD guide tube sleeve-to-alignment lug welds (CRGT-1), CRD guide tube body-to-sleeve welds (CRGT-2) and guide tube and fuel support alignment pin-to-core plate weld and pin (FS/GT-ARPIN-1). No recordable indications noted.
	2003	EVT-1	EVT-1 of CRGT-3 welds on 7 guide tubes. No indications noted.
	2005	N/A	No inspections this outage.
	2007	VT-3 EVT-1	1 alignment guide pin 2 CRGT-1, 2 CRGT-2, 1 CRGT-3 NRI
	2009	EVT-1/ VT-1	7 (Pins, CRGT-1, CRGT-2 & CRGT-3) NRI. Two of these performed from OD.

	2011	N/A	No guide tube inspections this outage. Baseline is complete.
	2013	EVT-1	7 CRGT-2 & 7 CRGT-3 (scope expansion from Unit 1 discovery in 2012.) NRI – Baseline Complete
	2015	N/A	Baseline complete, no inspections performed this outage.
	2017	N/A	Re-inspections not required.
CRD Stub Tube	N/A	N/A	N/A
	2007	VT-3	7 Stub Tube-to-vessel welds (30%) 7 Stub Tube-to-CRD housing welds NRI
	2009	VT-3	8 stub tube to vessel welds 8 stub tube to CRD housing welds 2 CRD housing welds NRI
	2011	VT-3	No bottom head inspections this outage
	2013	VT-3	8 stub tube to vessel welds 8 stub tube to CRD housing welds NRI
	2015	N/A	No bottom head inspections this outage.
	2017	N/A	No bottom head inspections in B223R1.
In-Core Housing	N/A	N/A	N/A
	2007	VT-3	2 ICH/RPV welds (30%) NRI
	2009	VT-3	4 inst. Tubes to vessel welds. NRI
	2011	N/A	None
	2013	VT-3	2 CRD Housing Welds. NRI
	2015	N/A	No in-core housing inspections this outage.
	2017	N/A	No in-core housing inspections in B223R1

Dry Tubes	2001	N/A	Replaced in 1987. Scheduled for inspection in 2001. BWRVIP does not require inspection of dry tubes.
	2003	N/A	No inspections performed on dry tubes.
	2005	N/A	No inspections performed this outage.
	2007	N/A	2 Dry Tubes – upper two feet, NRI per GE SIL. No indications noted.
	2009	VT-1	3 dry tubes – upper two feet from 2 adjacent cells. No indications noted.
	2011	VT-1	No Dry Tube Inspections this outage
	2013	VT-1	7 dry tube inspections this outage. NRI
	2015	VT-1	1 Dry Tube (NRI)
	2017	VT-1	Inspected 4 Dry Tubes with 2 NRI and 2 found with disengagement (RI). All four were replaced.
Instrument Penetrations	N/A	N/A	Examinations of instrument penetrations are performed in accordance with ASME Section XI requirements.
Vessel ID Brackets	to present	VT-1 in beltline area and VT-3 in other areas	Section XI inspections of dryer, feedwater sparger, core spray, and surveillance capsule holder brackets performed once per interval. Last inspections in 1997 with no indications noted.
	1999	VT-1/VT-3	Inspected Feedwater and Core Spray attachment welds to RPV with no indications noted.
	2001	EVT1/ VT-1/ VT-3	Inspected various jet pump riser brace arm pad to RPV welds, feedwater sparger end bracket to RPV welds, core spray bracket to RPV welds. No recordable indications noted
		EVT-1/ VT-3	EVT-1/VT-3 of 2 core spray header piping brackets and 4 dryer support brackets. VT-3 of 2 guide rod brackets and 4 steam dryer hold-down brackets. No indications noted.

	2005	EVT-1/ VT-1	2 Core Spray Brackets, 8 Feedwater Brackets, 4 JP Riser Brace welds. No indications noted.
	2007	EVT-1/ VT-1	1 Core Spray Bracket, 8 Feedwater Brackets, 4 JP Riser Brace welds. 8 Steam Dryer hold-down & support Brackets, 6 Surveillance specimen brackets. No indications noted
	2009	EVT-1/ VT-1	1 Core Spray Piping Bracket, 2 jet pump riser braces. No relevant indications.
	2011	EVT-1/ VT-1	1 Core Spray Piping Bracket, 20 jet pump riser brace welds. Surveillance specimen brackets at 30 deg. NRI
	2013	EVT-1/ VT-1	1 Core Spray Piping Bracket 12 Jet Pump riser brace welds 2 Specimen brackets & holder 2 Guide Rod Brackets 2 Steam Dryer Hold-down Brackets
	2015	EVT-1	1 Core Spray Piping Bracket (NRI) 8 Jet Pump riser brace welds (NRI) 1 Specimen brackets & holder (NRI) 8 Feedwater End Brackets (NRI) 4 Steam Dryer Support Brackets (NRI)
	2017	VT-1/VT-3	JP11-SL Sensing Line bracket (NRI) JP20-SL Sensing Line bracket (NRI) PB-30 (NRI) CSAHB-030L, CSAHB-030U (NRI)
LPCI Coupling		N/A	Not applicable to Brunswick.
Feedwater Spargers	2003	EVT-1/ VT-1/VT-3	EVT-1 of sparger tee welds, VT-1/VT-3 of sparger end bracket assemblies, VT-3 of sparger flow holes. EVT-1 of selected flow hole on each sparger. No changes in previously identified indications.
	2005	EVT-1/ VT-1/VT-3	EVT-1 of sparger tee welds, VT-1/VT-3 of sparger end bracket assemblies, VT-3 of sparger flow holes. EVT-1 of selected flow hole on each sparger. No changes in previously identified indications.
	2007	EVT-1/ VT-1	Same as above.

	2009	EVT-1/ VT-1	Same as above. No significant growth noted.
	2011	EVT-1/ VT-1/VT-3	VT-3 of spargers & end brackets. EVT-1 of one hole on each sparger. Loose part found in "C" Sparger. Some minor hole damage to 4 holes, One area of wear caused by loose part. Evaluated as acceptable by GEH. No other RI's.
	2013	EVT-1/ VT-1/VT-3	EVT-1 of sparger tee welds, VT-1/VT-3 of sparger end bracket assemblies, VT-3 of sparger flow holes. EVT-1 of selected flow hole on each sparger. No changes noted. No additional RI's.
	2015	EVT-1 VT-1,VT-3	12 Sparger Tee Box Welds (RI) 8 Sparger to end brackets (NRI) 144 Sparger Flow Holes (RI)
	2017	EVT-1 VT-1 VT-3	Sparger A @ 45° FW045-1(NRI), FW045-2(3previous RIs(on unreported) all no change), FW045-3(previous RI no change), FW045-4(NRI), FW-045-5(NRI), FW045BB-1(NRI), FW045-BB-2(NRI), FW045-FH-01-36(NRI), FW045-FH-04(previous RI no change), FWSEB-005(NRI), FWSEB-085(NRI). Sparger B @ 135° FW135-1(NRI), FW135-2(previous RI no change), FW135-3(previous RI no change), FW135-4(NRI), FW-135-5(NRI),FW135BB-1(NRI), FW135-BB-2(NRI), FW135-FH-01-36(NRI), FW135-FH-06(previous RI no change), FWSEB-095(NRI), FWSEB-175(NRI). Sparger C @ 225° FW225-1(NRI), FW225-2(previous RI no change), FW225-3(previous RI no change), FW225-4(NRI), FW-225-5(NRI),FW225BB-1(NRI), FW225-BB-2(NRI), FW225-FH-01-36(previous RI due to probe damage/no change), FW225-FH-26(previous RI no change), FWSEB-185(NRI), FWSEB-265(NRI).

			Sparger D @ 315° FW315-1(NRI), FW315-2(previous RI no change), FW315-3(NRI), FW315-4(NRI), FW-315-5(NRI), FW315BB-1(NRI), FW315-BB-2(NRI), FW3155-FH-01-36(previous RI no change)(RI due to FM), FW315-FH-28(previous RI no change), FWSEB-275(NRI), FWSEB-355(NRI)
Steam Dryer	2003	VT-1/VT-3	VT-1 of circular plate welds (this is the plate that failed at Quad Cities), VT-1 of drain channel welds and manhole cover, VT-3 of entire dryer assembly. No indications noted.
	2005	VT-1	Baseline of all steam dryer external welds. Two indications noted. Both IGSCC type cracking and both repaired.
	2007	VT-1	95 welds inspected, (red & green areas as denoted in BWRVIP-139) No indications noted.
	2009	VT-1	20% of assorted steam dryer welds inspected. Flaws identified on 1 of 2 tack welds of two lifting eyes to threaded rod connections.
	2011	VT-1	29 components (20%) inspected. One area on cover plate to upper support ring minor flaws (2). New flaw on skirt near drain channel, limited to ~3" max length. No significant flaws detected.
	2013	VT-1 (89)	29 components (20%) inspected. No additional significant flaws detected.
	2015	VT-1 (89)	33 components ~20% inspected. No additional significant flaws detected.
	2017	VT-1 (89)	Tie Bars: TB-03(NRI), TB-08(NRI) Lifting Rods: LE-325(2 new RI on tack weld along with existing tack weld, no change) Bank Vertical Welds: NW V-02(NRI), NW V-07(NRI), SE V-04(NRI), SE V-09(NRI), SW V-01(NRI),

			SW V-06(NRI), NE V-01(NRI), NE V-05(NRI), NE V-10(NRI) Bank Horizontal Welds: CPDB-270(NRI), DB1 H-2(NRI), DB1 H-7(NRI), DB2 H-3(NRI), DB3 H-1(NRI), DB3 H-6(NRI), DB4 H-4(NRI), DB5 H-2(NRI), DB5 H-7(NRI) Drain Channel Welds: DC44-L(NRI), DC158-R(NRI), DC322-L(NRI) Drain Pipes: NWDP-2(NRI), SWDP-1(NRI) Exterior Surfaces: CPSR-270(previous RI no change), USR/DS(NRI), DSVS-0(NRI), JBW-325(NRI), 90RB/CPL(NRI), 270RB/MHC-L(NRI)
DM Welds IAW BWRVIP-75-A	2009	Manual	2B11N2B-RPV-FWABA Category A 2B11N2C-RPV-FWABA Category A 2B11N2D-RPV-FWABA Category A No Relevant Indications reported.
	2011	Phased Array Manual	2B11N8A-RPV-SWAB Category C 2E21FF-4-FWRN5A Category D 2E21FF-8-FWRN6A Category D 2G3114-1-14-FW1949A Category D 2B32RECIRC-28-A-1 Category E 2B32RECIRC-28-B-1 Category E 2B11N9-RPV-FW2CRD52 Category D No Relevant Indications reported.
	2013	N/A	N/A
	2015	Automated UT	2B11N8B-RPV-SWAB Category D 2G3114-1-14-FW1949A Category C No Relevant Indications reported.
	2017	Automated UT	Safe End to nozzle N5B. (NRI) 2B11N5B-8-FWRN17, Category C RX Vessel nozzle N9 to CAP, (RI, required weld overlay repair) 2B11N9-RPV-FW2CRD52, Category D RPV nozzle N1B to Safe End, (NRI) 2B32RECIRC-28-A-1, Category E

			RPV nozzle N1A to Safe End, (NRI) 2B32RECIRC-28-B-1, Category E Trans. pc. FWRN5A to Safe End, (NRI) 2E21FF-4-FWRN5A, Category D Trans. pc. FWRN6A to Safe End (NRI) 2E21FF-8-FWRN6A, Category D RPV nozzle N2B to Safe End, (NRI) 2B11N2B-RPV-FWABA, RA-R1.14-2 RPV nozzle N2C to Safe End, (NRI) 2B11N2C-RPV-FWABA, RA-R1.14-2 RPV nozzle N2D to Safe End, (NRI) 2B11N2D-RPV-FWABA, RA-R1.14-2

Reactor Internals Inspection History

Plant: **Clinton Power Station**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
Core Shroud			
Horizontal Welds H1, H2, H3, H4, H5, H6A, H6B, and H7. Vertical Welds V11, V12, V13 and V14	4/2002 (C1R08)	UT	Performed UT of Horizontal Welds. Coverage: Weld Number Length — % of Examined Length H1 — 59.7% H2 — 67.4% H3 — 66.7% H4 upper side — 100.0% H4 lower side — 97.1% H5 upper side — 19.0% H5 lower side — 18.7% H6A — 16.4% H6B — 25.6% H7 — 26.5% V11 — 95.2% V12 — 95.0% V13 — 87.0% V14 — 87.0% The following identify flaws: Weld Number Length — % of Examined Length Flawed H1 — 0.0% H2 — 0.0% H3 — 19.1% H4 upper side — 97.2% H4 lower side — 74.0% H5 upper side — 15.3% H5 lower side — 0.0% H6A — 0.0% H6B — 5.4% H7 — 0.0% V11 — 0.0% V12 — 0.0% V13 — 0.0% V14 — 0.0%

Horizontal Welds H1, H2, H3, H4, H5, H6A, H6B, and H7. Vertical Welds V11, V12, V13 and V14	4/2002 (C1R08)	UT	Prior to startup an Engineering Evaluation was performed to justify continued operation for one cycle. Later on several other analyses performed as identified in VIP documents to document 2 cycles of operation. This plan was presented to the NRC. Planning to implement a repair modification in 2/2006 (C1R10).		
4 Tie Rods	2/2006 (C1R10)	Visual Inspection	4 Tie Rods installed in 2/2006 (C1R10). Inspection performed as required by VIP-76.		
Vertical Welds: V4, V5, V15, V16, V20, V21, V22, and V23	01/2008 (C1R11)	Visual Inspection	Performed Visual Examination of the following Vertical Welds. Coverage :		
			Weld Number Length	% of Examined Length	Inspection Results
			V4 (OD Only)	100.0%	Acceptable
			V5 (OD Only)	10.0%	Inspected 100% accessible area, but because out of correct angle due to this weld is right behind the LPCI line, except for the top area of the weld). Acceptable.
			V15 (OD Only)	10.0%	Tie Rod limits access to weld, changed 25% to 10%. Acceptable.
			V16 (OD Only)	50.0%	Top portion of the weld is hidden by Tie Rod. Acceptable.
			V20 (OD Only)	100.0%	Acceptable
			V21 (OD Only)	95.0%	Acceptable
			V22 (OD Only)	100.0%	Acceptable
			V23 (OD Only)	100.0%	Acceptable

Detail inspection of 2 Tie Rods at 65 deg. and 245 deg.	01/2008 (C1R11)	Detail Visual including tightness verification	Tie Rod at 65 deg. - Acceptable Tie Rod at 245 deg. - Acceptable
General inspection of the remaining 2 Tie Rods at 155 and 335 deg.	01/2008 (C1R11)	Visual Inspection	Tie Rod at 155 deg. - Acceptable Tie Rod at 335 deg. - Acceptable
Detail inspection of 2 Tie Rods at 155 deg. and 335 deg.	01/2010 (C1R12)	Detail Visual including tightness verification	Tie Rod at 155 deg. - Acceptable Tie Rod at 335 deg. - Acceptable Inspection required by BWRVIP-76 & Tie Rod Design.
General inspection of the remaining 2 Tie Rods at 65 and 245 deg.	01/2010 (C1R12)	Visual Inspection	Tie Rod at 65 deg. - Acceptable Tie Rod at 245 deg. - Acceptable Inspection required by BWRVIP-76 & Tie Rod Design.
Vertical Welds V11, V12, V13 and V14	12/2011 (C1R13)	UT	Performed UT of Vertical Welds. Coverage: Weld Number — % of Examined Length Length V11 — 84.0% V12 — 80.7% V13 — 81.7% V14 — 85.3% The following identify flaws: Weld Number — % of Examined Length Flawed Length V11 — 1.1% V12 — 0.0% V13 — 0.0% V14 — 0.0%
Tie Rod at 65 deg	12/2011 (C1R13)	VT-3	No indications identified.
Tie Rod at 65 deg Upper Support Corners	12/2011 (C1R13)	EVT-1	No indications identified.
Shroud Vert Welds: V4, V5, V15, V16, V20, V21, V22, and V23	10/2013 (C1R14)	EVT-1	Performed Visual Examination of the following Vertical Welds. Weld Number Length | % of Examined Length | Inspection Results

			V4 ID	10.00%	Acceptable. Core spray piping and spargers limit exam areas
			V4 OD	70.00%	Acceptable
			V5 ID	55.00%	Acceptable
			V5 OD	20.00%	Acceptable. LPCI piping obstructs exam area.
			V15 ID	0.00%	V15 is inaccessible due to core configuration at 165 deg.
			V15 OD	25.00%	Acceptable
			V16 ID	0.00%	V16 is inaccessible due to core configuration at 345 deg.
			V16 OD	60.00%	Acceptable
			V20 (OD Only)	85.00%	Acceptable
			V21 (OD Only)	90.00%	Acceptable
			V22 (OD Only)	100.00%	Acceptable
			V23 (OD Only)	100.00%	Acceptable
Tie Rod at 65 deg Upper Support Corners	2015 (C1R15)	VT-3	The Tie Rod Lower Limit Stop was inspected and found no change from the installed position. There were no relevant indications. The Tie Rod Lower Stabilizer and Wedge was inspected. There were no relevant indications. The Tie Rod Toggle Sleeve was inspected. There were some indications of blow-by noted on shroud support plate but there were no relevant indications. A picture from the inspection in 2010 was reviewed and no blow-by could be seen then. Customer Notification Report C1R15 IVVI-15-02 documented this observation.		

Shroud Support			
H8 and H9 Welds	10/2000 (C1R07)	EVT-1	EVT-1 of H8 and H9 welds for >10% length per VIP-38. No indications were identified.
H9 Weld	2/2004 (C1R09)	UT	UT of H9 weld for 100% length from outside the Reactor wall. No indications were identified.
H8 Weld	2/2006 (C1R10)	EVT-1	No indications were identified.
H8 Weld	12/2011 (C1R13)	EVT-1 & VT-1	No indications were identified.
H9 Weld	10/2013 (C1R14)	UT	UT of H9 weld for 100% length from outside the Reactor wall. No indications were identified.
H8 Weld	05/2017 (C1R17)	EVT-1	No indications were identified.
Access Hole Cover	2/2004 (C1R09)	VT-1	VT-1 of Access Hole Cover assembly per GE SIL 462. No indications were identified.
	1/2010 (C1R12)	EVT-1	EVT-1 of Access Hole Cover and Heat Affected Zone (HAZ). No indications were identified. Inspection required by BWRVIP-180.
	2015 (C1R15)	EVT-1	EVT-1 examinations were performed on the shroud support Access Hole Cover (AHC) and AHC weld. Some stains, scratches and light debris were noted but were non-relevant. There were no relevant indications.
Core Spray Baseline Inspection			
Core Spray Piping: P2, P3A, P3B, P4A, P4B, P5, and P6	10/2000 (C1R07)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and Low Pressure Core Spray piping systems. Two flaw indications, one on each BP2 and CP2 welds, were identified. Evaluated for 2 cycles operation per Core Spray Flaw Evaluation Handbook.
P4C and P4D	10/2000 (C1R07)	EVT-1	No indications were identified.
P8	10/2000 (C1R07)	VT-1	No indications were identified.
Core Spray Baseline Inspection			
Core Spray Spargers	10/2000 (C1R07)	EVT-1/ VT-1 (as required)	No indications were identified.

Core Spray Reinspection			
Core Spray Piping: P2's-all 4, P3A's-all 4, P3B-only 1, P4A-only 1, P4B-only 1, P5's-all 4, and P6-only 1.	2/2004 (C1R09)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and Low Pressure Core Spray piping systems. The two (2) existing flaw indications, one on each BP2, CP2 welds, were identified. These two (2) flaws grew in length. Evaluated for 2 additional cycles of operation per Core Spray Flaw Evaluation Handbook. In addition, one more flaw indication on weld DP2 was identified. This flaw indication was also evaluated for two (2) cycles of operation. No other indications were identified.
P4c-only 1 weld P4d-only 1 weld P8-only 1	2/2004 (C1R09)	EVT-1	No indications were identified.
A-PR, A-ADR, A-BDR, B-PR, B-CDR, and B-DDR	2/2004 (C1R09)	EVT-1	No indications were identified.
Core Spray Spargers	2/2004 (C1R09)	EVT-1/VT-1 (as required) Auto UT and EVT-1	No indications were identified.
A-PR, A-ADR, A-BDR, B-PR, B-CDR, B-DDR	2/2006 (C1R10)	EVT-1	No indications were identified.
A-BP4c, A-BP4d A-APB(PB1) A-BPB(PB2)	2/2006 (C1R10)	EVT-1	No indications were identified.
A-BP8	2/2006 (C1R10)	VT-1	No indications were identified.
Core Spray Piping: P2's-all 4, P3A's-all 4, P3B-only 1, P4A-only 1, P4B-only 1, P5's-all 4, and P6-only 1.	01/2008 (C1R11)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and Low Pressure Core Spray piping systems. The three (3) existing flaw indications, one on each BP2, CP2, and DP2 were identified. These three (3) flaws did not grow in last two (2) cycles. The previous evaluation for 2 additional cycles of operation is still valid per Core Spray

			Flaw Evaluation Handbook. No other relevant indications were identified.
A-PR, A-ADR, A-BDR, B-PR, B-CDR and B-DDR	01/2008 (C1R11)	EVT-1	No indications were identified.
A-AP2, A-AP5, A-BP2, A-BP3B, A-BP6, B-CP2, and B-DP2	01/2008 (C1R11)	EVT-1	No indications were identified.
A-APB(PB1), A-BPB(PB2), B-CPB(PB3), B-DPB(PB4)	01/2008 (C1R11)	EVT-1	No indications were identified.
B-CP8 - 187 deg.	01/2008 (C1R11)	VT-1	No indications were identified.
Core Spray Spargers	01/2008 (C1R11)	EVT-1/VT-1 (as required)	No indications were identified.
Grinding marks and evidence of cold work (except for P3a and P5)	01/2008 (C1R11)	VT-1	No specific grinding marks or evidence of cold work identified.
A-AP2, A-PR A-ADR, A-BP2, A-BDR, B-PR B-CP2, B-CDR B-CP3b, B-CP4c B-CP4d, B-CP6 B-DP2, B-DDR B-DP8	1/2010 (C1R12)	EVT-1	No indications were identified. Inspection performed per BWRVIP-18.
A-AP2, A-PR A-ADR, A-BP2, A-BDR, A-AP8, B-PR, B-CP2, B-DP2 B-CDR, B-CP3b, B-CP6, B-DDR	12/2011 (C1R13)	EVT-1	No indications were identified. Inspection performed per BWRVIP-18.
A-APB(PB1), A-BPB(PB2),	12/2011 (C1R13)	EVT-1	No indications were identified.
Core Spray Spargers	12/2011 (C1R13)	EVT-1/VT-1 (as required)	No indications were identified.

Core Spray Piping: P2's-all 4, P3A's-all 4, P3B-only 1, P4A-only 1, P4B-only 1, P5's-all 4, and P6-only 1.	12/2011 (C1R13)	UT	Performed UT on the identified piping welds on both High Pressure Core Spray and Low Pressure Core Spray piping systems. The three (3) existing flaw indications, one on each BP2, CP2, and DP2 were identified. These three (3) flaws grew in last two (2) cycles. Evaluated for 2 additional cycles of operation per Core Spray Flaw Evaluation Handbook. No other relevant indications were identified.
A-ADR, A-AP2, A-BDR, A-BP2, A-PR, B-CDR, B-CP2, B-DDR, B-DP2, B-DP4c, B-DP4d, B-PR	10/2013 (C1R14)	EVT-1	No indications were identified. Inspection performed per BWRVIP-18.
A-BP8	12/2011 (C1R13)	VT-1	No indications were identified.
Core Spray Piping	2015 (C1R15)	UT / EVT-1	Core Spray piping examinations included UT of the following three (3) welds: CS-A-BP2, CS-B-CP2, and CS-B-DP2. There were only very minor changes to the weld crack size from previous inspection. There were no other new relevant indications. Also, fifty-five (55) EVT-1 examinations were completed for these weld locations: CS-A-AP2, CS-A-AP3a, CS-A-AP5, CS-A-BP3a, CS-A-BP5, CS-B-CP3a, CS-B-CP5, CS-B-DP3a, CS-B-DP3b, CS-B-DP4a, CS-B-DP4b, CS-B-DP5, CS-B-DP6, CS-A-AS2-006, CS-A-AS4-089, CS-A-ADSB-280, CS-A-BS2-172, CS-A-BS4-091, CS-A-BCSB-100, CS-B-CPB(PB3), CS-B-CS2-186, CS-B-CS4-091, CS-B-DP3b, CS-B-DP6, CS-B-DPB(PB4), CS-B-DS2-352, CS-B-DS4-089, CS-A-AS2-008, CS-A-AS4-271, CS-A-ADSB-306, CS-A-ADSB-320, CS-A-ADSB-40, CS-A-ADSB-53, CS-A-ADSB-80, CS-A-BS2-174, CS-A-BS4-269, CS-A-BCSB-126, CS-A-BCSB-140, CS-A-BCSB-220, CS-A-BCSB-233, CS-A-BCSB-280, CS-B-CS2-188, CS-B-CS4-269, CS-B-DS2-354, CS-B-DS4-271, CS-A-PR, CS-A-ADR, CS-A-BDR,

			CS-B-PR, CS-B-CDR, CS-B-DDR, CS-A-AP2, CS-A-BP2, CS-B-CP2, and CS-B-DP2. There were no relevant indications.
Core Spray Sparger	2015 (C1R015)	VT-1	Examinations were completed for these core spray sparger weld locations: CS-A-AS3a&b, CS-A-AS3c, CS-A-BS3a&b, CS-A-BS3c, CS-B-CP8, CS-B-CS3a&b, CS-B-CS3c, CS-B-DS3a&b, and CS-B-DS3c. One (1) recordable Indication was made: a metal burr on a bracket bolt hole. INR-C1R15 IVVI 15-11 identified on CS-A-ADSB-280). There were no other relevant indications.
A-ADR, A-AP2, A-AP4c, A-AP4d, A-BDR, A-BP2, A-PR, B-CDR, B-CP2, B-CP4c, B-CP4d, B-DDR, B-DP2, and B-PR	05/2017 (C1R17)	EVT-1	No indications were identified.
B-DP8	05/2017 (C1R17)	VT-1	No indications were identified.
Top Guide			
Hold Down Assembly including Bolts and Nuts	2/2004 (C1R09)	VT-3	Performed VT-3 of the Top Guide including Bolts and Nuts. No indications were identified.
Hold Down Assembly including Bolts and Nuts	12/2011 (C1R13)	VT-3	Performed VT-3 of the Top Guide Studs, Bolts and Nuts. No indications were identified.
Top Guide Cell	1/2010 (C1R12)	EVT-1	Two cells visually inspected per VIP-183. No indications were identified.
Top Guide Rim Weld	1/2010 (C1R12)	EVT-1	Inspected at 0 and 180 degrees. No indications were identified.
Top Guide	2015 (C1R15)	EVT-1	Top Guide inspections included: -TG Cell 28-21 TG Beam north and east face. Results were SAT. -TG Cell 28-25 TG Beam. North face had scratches and rub marks. -TG Rim Weld at 0 deg. Results were SAT. -TG Rim Weld at 180 deg. Results indicated some scratches and weld marks. There were no relevant indications.
Core Plate – Not applicable to Clinton			

Standby Liquid Control – Not applicable to Clinton			
Jet Pumps			
High Priority Welds RS-3 Welds (50%)	10/2000 (C1R07)	EVT-1	Performed EVT-1 of remaining High Priority welds. No indications were identified.
	2/2004 (C1R09)	EVT-1	Performed EVT-1 of remaining High Priority welds. No indications were identified.
	1/2010 (C1R12)	EVT-1	Performed EVT-1 of remaining High Priority welds. No indications were identified.
Medium Priority RS-1 Welds (50%)	4/2002 (C1R08)	EVT-1	Performed EVT-1 of remaining Medium Priority welds. No indications were identified.
	01/2008 (C1R11)	EVT-1	A gouge was identified outside the exam area of RS-1 JP#8.
RS-1 Welds (25%)	10/2013 (C1R14)	EVT-1	Performed EVT-1 on JP-1/2, JP-3/4, JP-7/8. No indications were identified.
Riser Welds RS-2, RS-6, RS-7 RS-8, and RS-9 (50%)	2/2004 (C1R09)	EVT-1	No indications were identified.
	01/2008 (C1R11)	EVT-1	No indications were identified.
Riser Welds RS-8, and RS-9 (50%)	01/2010 (C1R12)	EVT-1	Ten RS-8 and ten RS-9 welds were inspected. No indications were identified.
Riser Brace RB-1a,b,c,d and RB-2a,b,c,d (50%)	2/2004 (C1R09)	EVT-1	No indications were identified.
	01/2008 (C1R11)	EVT-1 & VT-1	No indications were identified.
	01/2010 (C1R12)	EVT-1	No indications were identified.
Riser Brace RB-1a,b,c,d and RB-2a,b,c,d (25%)	10/2013 (C1R14)	EVT-1	Performed EVT-1 on JP-1, JP-2, JP-3, JP-4, JP-15, JP-16. No indications were identified.
Inlet Mixer IN-1 and IN-2 welds (50%)	2/2004 (C1R09)	EVT-1	No indications were identified.
	01/2008 (C1R11)	EVT-1	No indications were identified.
Inlet Mixer IN-1 and IN-2 welds (25%)	10/2013 (C1R14)	EVT-1	JP-1, JP-2, JP-3, JP-4, JP-15, and JP-16. No indications were identified.

Sensing Lines (50%)	2/2004 (C1R09)	VT-1	No indications were identified.
	01/2008 (C1R11)	VT-1	No indications were identified.
	10/2013 (C1R14)	VT-1	No indications were identified.
	05/2017 (C1R17)	VT-1	No indications were identified.
Wedge Bearing Surface WD-1	2/2004 (C1R09)	VT-1	50 % were inspected. No indications were identified.
	2/2006 (C1R10)	VT-1	Four (4) were inspected. No indications were identified.
	01/2008 (C1R11)	VT-1	Six (6) were inspected. No indications were identified.
	01/2010 (C1R12)	VT-1	Thirteen (13) were inspected. No indications were identified.
Jet Pump Diffuser Welds AD-1, AD-2, DF-1 DF-2, and DF-3.	2/2004 (C1R09)	UT	UT was performed on all welds of 100% diffusers
Jet Pump Diffuser Welds	10/2013 (C1R14)	EVT-1	
AD-1			JP-1, JP-2, JP-3, JP-5. No indications identified.
AD-2			JP-1, JP-2, JP-3, JP-4, JP-5. No indications identified.
DF-1			JP-1, JP-5. No indications identified.
DF-2			JP-1, JP-2, JP-3, JP-4, JP-5. No indications identified.
DF-3			JP-1, JP-2, JP-3, JP-5. No indications identified.
Jet Pump Beams Baseline	01/2008 (C1R11)	UT	No indications identified.
Jet Pump Beams Re-Inspection	10/2013 (C1R14)	UT	No indications identified.
Jet Pump Fouling A, B, and C	01/2010 (C1R12)	VT-1	Four JP Fouling were inspected. No indications were identified.
Jet Pump Fouling A, B, and C	12/2011 (C1R13)	VT-1	Four JP Fouling were inspected. No indications were identified.
Jet Pump Fouling A, B, and C	10/2013 (C1R14)	VT-1	Four JP Fouling were inspected. No indications were identified.
Jet Pump	2015 (C1R15)	VT-1/ EVT-1	Jet Pumps were examined at the locations indicated below for Diffuser Collar weld (DF), Adapter to Adapter Bottom weld (AD), Riser Pipe welds and transition (RS), Wedge bearing (WD) surface:

			JP-04 AD-1 EVT-1 JP-04 DF-3 EVT-1 JP-02 DF-1 EVT-1 JP-03 DF-1 EVT-1 JP-04 DF-1 EVT-1 JP 1 WD-1 VT-1 JP 2 WD-1 VT-1 JP 3 WD-1 VT-1 JP 4 WD-1 VT-1 JP 5 WD-1 VT-1 JP 6 WD-1 VT-1 JP 11/12 RS-3 EVT-1 JP 13/14 RS-3 EVT-1 JP 15/16 RS-3 EVT-1 JP 17/18 RS-3 EVT-1 JP 19/20 RS-3 EVT-1 In addition, VT-1 examinations were performed at the inlet mixer throat for fouling for jet pumps listed below. These examinations have no acceptance criteria, and results are used for monitoring and trending by systems engineering. IVVI-JP-Foul-1 IVVI-JP-Foul-2 IVVI-JP-Foul-3 IVVI-JP-Foul-4 There were no relevant indications.
Jet Pump Fouling A, B, and C. JP 3s 5, 10, 11, & 19.	05/2017 (C1R17)	VT-1	Four JP Fouling were inspected. No indications were identified.
CRD Guide Tube			
CRD Guide Tube	4/2002 (C1R08)	EVT-1/VT -3 (as applicable)	11% examined (17) per VIP-47, CRDGT-1,2,3 and pin. No indications were identified.
Dry Tubes			
4 IRM	4/2002 (C1R08)	VT-3	No indications were identified.
	2/2004 (C1R09)	VT-1	No indications were identified.
	2/2006 (C1R10)	VT-3	No indications were identified.
	1/2008 (C1R11)	VT-3	No indications were identified.

	1/2010 (C1R12)	VT-1	No indications were identified. Inspection performed per GESIL-409.
	12/2011 (C1R13)	VT-3	No indications were identified. Inspection performed per GESIL-409.
	10/2013 (C1R14)	EVT-1	Four (4) IRM's were inspected. One indication was found on IRM C and one indication was found on IRM E.
SRM	2/2004 (C1R09)	VT-1	Four (4) SRM's were inspected. One indication identified on SRM 'D'. Evaluated for operating one cycle.
	2/2006 (C1R10)	VT-3	One (1) SRM was inspected. No indications were identified.
	2/2006 (C1R10)	VT-3	SRM 'D' dry tube was replaced in C1R10.
	1/2008 (C1R11)	VT-3	Two (2) SRM's were inspected. One indication identified on SRM 'A'.
	1/2010 (C1R12)	VT-1	Two (2) SRM's were inspected. No indications were identified.
	12/2011 (C1R13)	VT-3	Two (2) SRM's were inspected. One indication identified on SRM 'B'.
	10/2013 (C1R14)	EVT-1	Two (2) SRM's were inspected. One indication was identified on SRM 'C'. One indication of plunger wear was identified on SRM 'D'. SRM B was replaced in C1R14.
	05/2017 (C1R17)	EVT-1	Partial Examination; Two (2) SRMs, A & B, were inspected, No indications identified. SRM 'A' examined 100%; SRM 'B' examined only 75%.
4 LPRM	2/2006 (C1R10)	VT-3	No indications were identified.
	1/2008 (C1R11)	VT-3	No indications were identified.
	1/2010 (C1R12)	VT-1	No indications were identified.
	12/2011 (C1R13)	VT-3	No indications were identified.
	10/2013 (C1R14)	EVT-1	Four (4) LPRM's were inspected. Two LPRM's had indications identified (not IGSCC). The lower flow holes of two LPRM plungers were covered over from inside.
ICM Dry Tubes	2015 (C1R15)	EVT-1	Ten (10) Dry Tubes were examined from all 4 quadrants of the cell:

			-IRM A (14-43), -IRM B (14-11), -IRM G (38-11), -IRM H (46-43), -LPRM 14-23, -LPRM 14-31, -LPRM 14-47, -LPRM 30-07, -LPRM 38-39, -LPRM 46-47. Two (2) relevant indications were found: (1) INR C1R15 IVVI-15-03 identified internal partial blockage in the cooling outlet holes for the six LPRMs examined. The area of blockage is <u>not</u> associated with the spring housing. (2) INR C1R15 IVVI-15-12 identified crack-like indications on IRM A (14-43), in the NE and NW quadrant locations.
	05/2017 (C1R17)	EVT-1	No indications were identified.
Instrument Penetrations			
Instrument Penetrations	N/A	N/A	N/A
Vessel Interior			
Interior	10/2000 (C1R07)	VT-3	Section XI inspection. No indications were identified.
	2/2004 (C1R09)	VT-3	Section XI inspection. No indications were identified.
	01/2008 (C1R11)	VT-3	Section XI inspection. No indications were identified.
	12/2011 (C1R13)	VT-3	Section XI inspection. No indications were identified.
Brackets			
Steam Dryer Hold Down Brackets	10/2000 (C1R07)	VT-3	Section XI inspection. No indications were identified.
	12/2011 (C1R13)	VT-3	Section XI inspection. No indications were identified.
Steam Dryer Support Brackets	10/2000 (C1R07)	VT-3	Section XI inspection. No indications were identified.
	2/2004 (C1R09)	EVT-1	Several brackets have contact marks and several brackets do not. Clinton will be monitoring this condition.

	2/2006 (C1R10)	EVT-1	No change in contact mark.
	1/2008 (C1R11)	EVT-1/ VT-1/-3	No change in contact mark.
	1/2010 (C1R12)	EVT-1	No change in contact mark.
	12/2011 (C1R13)	EVT-1 & VT-3	No change in contact mark.
	2015 (C1R15)	EVT-1	Inspection of Steam Dryer support bracket welds located at 034^0, 090^0, 145^0, 220^0, and 270^0 found no changes from previously identified indications. Location at 326^0 showed a slight change from the observation in C1R13. A gouge was noted on the left hand side. All other locations did not shown any change. INR C1R15 IVVI-15-05 documented recordable indications identified in previous inspections. No other changes from previous inspections were observed.
	05/2017 (C1R17)	EVT-1	SD Bracket @ 326Deg Only. No discernible changes were noted compare to previous outage.
Guide Rod Support Brackets	10/2000 (C1R07)	VT-3	Section XI inspection. No indications identified.
	2/2006 (C1R10)	VT-1	No indications identified. Guide rods and brackets were inspected to look for any damage caused by steam separator lower bracket.
	12/2011 (C1R13)	VT-1 & VT-3	BWRVIP-48A and Section XI inspection. No indications identified.
	05/2017 (C1R17)	VT-1	Guide Rod Upper Attachments, Brackets, and Welds were inspected. No indications identified.
Surveillance Sample Brackets	2/2004 (C1R09)	VT-1	Section XI inspection is SAT. However, both lower tack welds on 2 of the brackets found to be cracked. Evaluated for continued operation. Clinton will inspect these brackets in next refueling outage.
	2/2006 (C1R10)	VT-1	Inspected brackets at 3 deg. and 177 deg. and previously identified cracks. No change was observed.
	1/2008 (C1R11)	VT-1	Inspected brackets at 3 deg. and 177 deg. and previously identified cracks. No change was observed. Also, inspected the

			third one located at 183 deg. both upper and lower. No indications identified.
	1/2010 (C1R12)	VT-1	Inspected brackets at 3 deg. and 177 deg. and previously identified cracks. No change was observed.
	05/2017 (C1R17)	VT-1	Inspected Brackets at 3 deg, 173 deg, & 183 deg. No discernible changes were noted to 3 deg & 173 deg Surveillance Sample Holders. Two (2) new indications were reported on the lower left and right outer tack welds of the 183 deg bracket.
Core Spray Bracket Attachments	12/2011 (C1R13)	VT-3	Section XI inspection. No indications identified.
	2015 (C1R15)	EVT-1	The following attachment welds to the reactor vessel wall were examined: Core Spray Piping A&B Primary Bracket attachments, and Steam Dryer Support & Holddown attachments. Some scratches, grind marks, rub marks, and punch marks were noted but these were not recordable indications. There were no new relevant indications identified on Core Spray bracket attachments: CS-A-APB-PB1 CS-A-BPB-PB2 CS-B-CPB-PB3 CS-B-DPB-PB4
Jet Pump Bracket Attachments	10/2013 (C1R14)	EVT-1/VT-1	EVT-1 was done on JP-1, JP-2, JP-3, JP-4, JP-5, JP-6, JP-7, JP-8, JP-9, JP-10, no indications identified. VT-1 was for Section XI inspection, no indications identified.
	05/2017 (C1R17)	EVT-1	EVT-1 was performed on JP-11, JP-12, JP-13, JP-14, JP-15, JP-16, JP-17, JP-18, JP-19, JP-20. No indication identified.
Steam Separator (1/2)			
Steam Separator (1/2)	10/2000 (C1R07)	VT-3	One minor dent identified.
	2/2004 (C1R09)	VT-3	Inspected previously identified dent/deformation. No change identified.
Lower Bracket @ 0 deg	2/2006 (C1R10)	VT-3	Performed VT-3 of Steam Dryer Tie Rods. No indications identified.
Guide Rod Flange 0 deg	12/2011 (C1R13)	VT-3	Slight gouge was identified. No change from C1R10 identified.
Guide Rod Flange 180 deg			No indications identified.

Lifting Eye 80 deg			2 slivers on the Upper Ring were identified and wear noted on both upper and lower intersections of lug to ring
Lifting Eye 150 deg			Wear noted on upper ring to assembly to lug.
Lower Tie Straps (0-90 deg)			No indications identified.
Lower Tie Straps (90-180 deg)			No indications identified.
Gussets (0-90 deg)			No indications identified.
Gussets (90-180 deg)			No indications identified.
Tie Bars (0-90 deg)			No indications identified.
Tie Bars (90-180 deg)			No indications identified.
Tubes (0-90 deg)			No indications identified.
Tubes (90-180 deg)			No indications identified.
Standpipe (0-90 deg)			No indications identified.
Standpipe (90-180 deg)			No indications identified.
Standpipe Gussets (0-90 deg)			No indications identified.
Standpipe Gussets (90-180 deg)			No indications identified.
Standpipe Gussets (180-270 deg)			No indications identified.
Standpipe Gussets (270-360 deg)			No indications identified.
Upper Support Ring (0-90 deg)			No indications identified.
Upper Support Ring (90-180 deg)			No indications identified.
Lifting Eye 80 deg	10/2013 (C1R14)	VT-3	Wear at upper support ring interface, tack weld on the bottom of the rod was missing.
Lifting Eye 150 deg			Wear noted on rod to upper support ring interface.
Lifting Eye 260 deg			Indications noted on tack welds on the bottom of the rod. Wear noted on interface between rod and upper ring.
Lifting Eye 330 deg			Wear noted on lifting rod interface to upper support ring.
Lower Tie Straps (180-270 deg)			No indications identified.
Lower Tie Straps (270-360 deg)			No indications identified.
Gussets (180-270 deg)			No indications identified.
Gussets (270-360 deg)			No indications identified.
Tie Bars (180-270 deg)			No indications identified.

Tie Bars (270-360 deg)			No indications identified.
Tubes (180-270 deg)			No indications identified.
Tubes (270-360 deg)			No indications identified.
Standpipe (180-270 deg)			No indications identified.
Standpipe (270-360 deg)			Examined previous indication, no change was identified.
Standpipe Gussets (180-270 deg)			No indications identified.
Standpipe Gussets (270-360 deg)			No indications identified.
Upper Support Ring (180-270 deg)			No indications identified.
Upper Support Ring (270-360 deg)			No indications identified.
Steam Dryer			
Tie Bars	4/2002 (C1R08)	VT-3	Performed VT-3 of Steam Dryer Tie Bars. No indications identified.
Drain Channel #8 to the Skirt (V16)	4/2002 (C1R08)	VT-3	The existing crack on drain channel #8 to the skirt was measured 7 5/8". No change from the previous outages. This crack was identified in 1/1989 (C1R01). Clinton has been monitoring this crack since C1R01. C1R08 is the baseline for this crack since Clinton has been operating at higher power after C1R08.
	4/2004 (C1R09)	VT-3	The existing crack on drain channel #8 to the skirt was measured 8 3/4". It grew 11/8" in one cycle. In C1R08 (4/2002) it was measured 7 5/8". This crack was repaired in C1R09 (2/2004) using under water welding.
Drain Channel Welds	2/2006 (C1R10)	N/A	Drain Channel welds were re-inforced from 1/8" to 1/4"
All Banks, Coverplates, End Panels, Hoods, Drain Channels, Skirt, Top and Tie Bars etc. from outside.	2/2004 (C1R09)	Best Effort VT-1/VT-3	All welds were examined from outside. One minor dent was recorded. No other indications were identified.
	2/2006 (C1R10)	VT-1	All welds examined from outside. 1) An indication was observed in the drain channel base material, away from the weld. The indication appears to be a minor mechanical deformation. This indication was evaluated for continued operation. 2) Two (2) indications were observed in the dryer bank 5 horizontal weld H3. These indications are located under tie

			rods 28 and 30. They are 12.75" and 2.25" long. These indications were repaired by stop drill method. 3) A linear indication was observed in the dryer upper guide at 0 deg. This indication is 1.6" long. This indication was evaluated for continued operation. 4) Several linear indications were observed in the dryer upper support ring face. They are located at various locations and degrees. These were evaluated for continued operation.
	1/2008 (C1R11)	VT-1	1) Examination was performed from the outside of the dryer. A base metal crack was observed adjacent to drain channel 7, weld V-14. Another crack like indication was observed in the skirt adjacent to the V-6 weld, in the area of an access hole patch. Scope was expanded to perform examination from the inside of the dryer. 2) Examination was performed from the inside of the dryer using Firefly. The steam dryer inside area of the access hole patches were examined. The inspections observed several linear indications in the base material at all 6 access hole patches. Evaluated for continued operation. 3) The upper support ring was examined. Cracking was observed in the upper support ring at the location of 210 inside access hole patch. Evaluated for continued operation.
All Banks, Coverplates, End Panels, Hoods, Drain Channels, Skirt, Top and Tie Bars etc. from outside.	1/2010 (C1R12)	VT-1-89	1) Performed VT-1-89 of 32 Steam Dryer Tie Rods. Indication on Tie Rod 28 from C1R11, has no new growth or new indications. 2) Steam Dryer Lower Support Ring Contact area has an indication from a past outage, with no change in C1R12. 3) Drain Channels 3, 5, and 7 have indications from previous outages, but have no changes. Inspection was satisfactory. 4) The six Steam Dryer Access Holes from C1R11 were reinspected, there is no change. 5) Banks 1-5 were visually inspected. Bank 5 had an indication found in C1R10, there was no change to the indication.

Steam Dryer Lower Support Ring	12/2011 (C1R13)	VT-1-132	Steam Dryer Lower Support Ring Contact area has an indication from a past outage, with no change in C1R13.
Steam Dryer	2015 (C1R15)	VT-1-89	The Steam Dryer (SD) inspection was comprehensive with 158 VT-1 examinations ID and OD. The scope of exams included: -SD access hole patch at locations 34^0, 90^0, 145^0, 210^0, 270^0, 325^0, - Drain Ch. 3, V-weld 6, and - Drain Ch. 7, V-weld 14. Customer Notification Report CNR C1R15 IVVI-15-01 identified that Tie Bar 12 has a slight bow as viewed from end to end. This bow condition was also noted in the C1R12 inspection. The following relevant indications were identified: INR C1R15 IVVI 15-01 indicates the examination of Upper Guide Bracket at 0^0 did not find any from previous inspection in C1R12. INR C1R15 IVVI 15-03 documents an indication on Access Hole Patch at 325^0. INR C1R15 IVVI 15-04 documents a lower guide bracket indication. INR C1R15 IVVI 15-06 documents drain channels 3, 5, & 7 weld indications. INR C1R15 IVVI 15-07-R1 documents that the Upper Support Ring inspection of indications previously identified found no changes. INR C1R15 IVVI 15-08 indicates the access patch hole inspection at 90^0 did not find any change from inspection in C1R11. INR C1R15 IVVI 15-09 indicates that Bank 5 Horizontal weld H3 at Tie Bar 28 and Tie Bar 30 was examined and found no changes from the description in C1R12. Also, the inspection found no change to the stop drill holes on either side of the two indications INR C1R15 IVVI 15-13 SD Lower ring beam surface damage at 135^0 showed no changes from previous inspection in C1R12.

Steam Dryer Access Hole Patch @ 325 deg from OD	05/2017 (C1R17)	VT-1-89	No discernible changes were noted compare to the previous outage.
LPCI Coupling			
Loops 'A' and 'B' Except weld 6-6b.	10/2000 (C1R07)	EVT-1	Performed EVT-1 of LPCI Couplings, both Loops 'A' and 'B'. No indications were identified.
Loop 'C' Except weld 6-6b.	4/2002 (C1R08)	EVT-1	Performed EVT-1 of LPCI Coupling 'C'. No indications were identified.
Weld 6-6b's (all 3 loops)	2/2004 (C1R09)	EVT-1	Performed EVT-1 on all 3 loops. No indications were identified.
Reinspection LPCI Coupling Loop 'A'	2/2006 (C1R10)	EVT-1	No indications were identified.
Reinspection LPCI Coupling Loop 'B'	1/2010 (C1R12)	EVT-1	No indications were identified.
Reinspection LPCI Coupling Loop 'C'	10/2013 (C1R14)	EVT-1	No indications were identified.
Reinspection LPCI Coupling Loop 'A'	05/2017 (C1R17)	EVT-1	No indications were identified.
Feedwater Spargers			
FW Sparger End Brackets	4/2002 (C1R08)	EVT-1	Performed EVT-1 on Feedwater Sparger End Brackets. No indications were identified.
	1/2008 (C1R11)	VT-1	Performed VT-1 of End Bracket Bolt Stops only. Evidence of movement and wear were observed on four (4) out of eight (8) End Bracket Bolts. This condition was evaluated and accepted for continued operation.
	1/2010 (C1R12)	VT-3	Performed VT-3 of End Bracket Bolt Stops only. Four out of eight, had evidence of movement and wear from C1R11, there was no change in indication sizes.
	12/2011 (C1R13)	VT-1 & EVT-1	Performed VT-1 of End Bracket Bolt Stops only. Four out of eight, had evidence of movement and wear from C1R11, there was no change in indication sizes. Performed EVT-1 on Feedwater Sparger End Brackets. No indications were identified.

	10/2013 (C1R14)	VT-1	Performed VT-1 of Bolt, Nut and Tack Welds. Four out of eight, had evidence of movement and wear from C1R11, there was no change in indication sizes.
	2015 (C1R15)	VT-1	Feedwater Sparger End Brackets were inspected to determine any change to the wear on the bolt stops: FSB-1, FSB-2, FSB-3, FSB-4, FSB-5, FSB-6, FSB-7 and FSB-8. INR C1R15 IVVI-15-10 identified a relevant indication noting that FSB-2 bolt has rotated clockwise, and has slight wear into bracket on the vessel side of the pin. There was no apparent change from previously noted indications. There was some non-relevant movement between the top of the wall bracket and the top plate of the FW end bracket.
	05/2017 (C1R17)	VT-1	Performed VT-1 of End Bracket Bolt Stops only. Four out of eight, had evidence of movement and wear since C1R11, there was no change in indication sizes identified in prior outages. New wear was noted on the FSB-4-173 deg pin head on Vessel side. This area was not examined previously due to access restrictions, but was able to be examined this outage. Performed EVT-1 on Feedwater Sparger End Brackets Welded Attachments to the RPV Wall. No indications were identified.
FW Sparger	4/2002 (C1R08)	VT-3	Performed visual inspection of feedwater spargers per NUREG-0619. No indications were identified.
	1/2010 (C1R12)	VT-3	Sparger was VT-3 inspected at 45, 135, 225, and 315 degrees. No indications were identified.
	05/2017 (C1R17)	VT-3	Performed VT-3 examination on FW Spargers at 45, 135, 225, and 315 degrees. No indications were identified.
BWRVIP-75-A Cat "D" Dissimilar Welds			
Dissimilar Welds, Cat "D"	1/2006 (C1R10)	UT	Performed UT on 26 DM welds (23 of these contain Inconel 182 buttering). No indications identified.
Dissimilar Welds, Cat "D"	1/2008 (C1R11)	UT	Performed UT on 5 DM welds (all 5 welds contain Inconel buttering.) No indications identified.
Dissimilar Welds, Cat "D"	1/2010 (C1R12)	UT	No examinations required or performed.

Dissimilar Welds, Cat "D"	12/2011 (C1R13)	UT	Performed UT on 26 DM welds (23 of these contain Inconel 182 buttering). No indications identified.
Dissimilar Welds, Cat "D"	10/2013 (C1R14)	UT	Performed UT on 5 DM welds. No indications identified.
Dissimilar Welds, Cat "D"	05/2017 (C1R17)		Performed UT on 26 DM welds (23 of these contain Inconel 182 buttering). One planar indication in weld N1B-W-1 was identified needed evaluation. This indication is not connected to the ID surface. Per the ISI Program this weld is evaluated per IWB-3514 and justified continued operation.

Reactor Internals Inspection History

Plant: **Columbia Generating Station**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	1994	UT	35% weld H3, 10% of weld H4. No indication of cracking. Proactive examination as a category A plant.
	1998	UT	Baseline examination of all accessible areas of welds H3, H4, H5 and H7. per BWRVIP-01. No cracking found.
	2007	UT	Examination of accessible portions of H3, H4(upper), H6A and H7 per BWRVIP-76. H3 2.7% flaws H4 6.2% flaws H6A 0% flaws H7 0% flaws
	2013	UT	Examination of circumferential welds. Flaws on H4 exceeded 10% requiring scope expansion per BWRVIP-76. All horizontal and some vertical welds were examined. H1, H2, H4 and H6B flaws exceeded 10%. H3, H5, H6A, and H7 flaws were less than 10%. No flaws were reported on the vertical welds.
	2017	EVT-1	Inspections for off-axis indications from the shroud ID. One 1.4" branching indication was reported on the plate side of the H3 weld.
Shroud Support	1994	VT-1	ASME Section XI includes access hole covers. No indications
	2003	VT-1, VT-3	No indications
	2005	UT EVT-1	H9 NRI (BWRVIP-38) H8 NRI (BWRVIP-38)
	2007	EVT-1	Access hole covers NRI (BWRVIP-180)

	2011	EVT-1	H8 Top side NRI
	2013	EVT-1	AHC at 0 and 180 degrees examined with no recordable indications.
	2015	UT	H9 NRI
	2017	VT-1, VT-3	H8 Top side, NRI. With JP-11 removed for maintenance, examined underside of H9, and shroud support leg welds H10, H11, H12 at 180 and 210 degrees, NRI.
Core Spray Piping	1985 to 1997	VT-1 IEB 80-13	No indications of cracking. One mil wire resolution
	1998	MVT-1 IEB 80-13	No indications of cracking
	1999	VT-1 IEB-80-13	No indications of cracking. One mil wire resolution
	2001	EVT-1	No indications of cracking
	2003	EVT-1	No indications of cracking (BWRVIP-18)
	2005	EVT-1	NRI
	2007	EVT-1	NRI
	2009	EVT-1	NRI
	2011	EVT-1	NRI
	2013	EVT-1	NRI
	2015	EVT-1	NRI
	2017	EVT-1	NRI
Core Spray Sparger	1985-1997	VT-1 IEB 80-13	No indications of cracking. One mil wire resolution
	1998	MVT-1 IEB 80-13	No indications of cracking

	1999	VT-1 IEB 80-13	No indications of cracking. One mil wire resolution
	2001	VT-1	No indications of cracking
	2003	EVT-1 VT-1	No indications of cracking (BWRVIP-18)
	2005	EVT-1 VT-1	No indications of cracking
	2007	EVT-1 VT-1	No indications of cracking
	2009	EVT-1 VT-1	No indications of cracking
	2011	EVT-1 VT-1	IGSCC found around 9 of twelve sparger bracket azimuths. Indications were found around middle and lower brackets on the shroud side HAZ. No indications were found around top brackets.
	2013	EVT-1 VT-1	Re-examined indications around sparger brackets with VT and UT verified cracks were shallow with only minor growth.
	2015	EVT-1	Performed scheduled sparger exams and re-examined indications around the sparger brackets. Only minor changes noted in the bracket to shroud indications. The exam also includes reported indications around the LPCI baffle.
	2017	EVT-1	Re-examined indications around the sparger brackets, no apparent changes.
Top Guide (Rim, etc.)	1994	VT-1, VT-3	ASME Section XI. No indications Inspected 48 cells NRI
	2005	VT-3	Top Guide C-Clamp NRI
	2009	EVT-1	Top Guide Beams NRI (BWRVIP-183)
	2013	EVT-1	Top Guide Beams NRI (BWRVIP-183)

	2015	VT-3	Top Guide C-Clamps (four) NRI.
Core Plate (Rim, etc.)	NA	NA	NA
SLC	NA	NA	SLC routed through HPCS system
	2007	VT-2	Not required by BWRVIP-27. VT-2 exam during hydro test. No recordable indications.
	2009	VT-2	NRI
	2011	VT-2	NRI
	2013	VT-2	NRI
	2015	VT-2	NRI
	2017	VT-2	NRI
Jet Pump Assembly	1985-1997	VT-1, VT-3, UT	JP Beams replaced 1994. No indications found on old beams. Adjusting screws, wedges, sensing lines and clamps done to various GE SILS. Found one sensing line cracked at support. Acceptable for service. Found several adjusting screws with gaps between screw and inlet mixer. Reduced gaps by resetting JP and installing wedges. Found one adjusting screw tack weld cracked on two JP. Acceptable for continued service.
	1998	VT-1	Found one adjusting screw with gaps between screw and inlet mixer. Acceptable for continued service.
	1999	VT-1	Found three adjusting screws with small gaps between screw and inlet mixer. Acceptable for continued service.
	2001	EVT-1	BWRVIP-41 inspections. Found five pumps with small gaps between screw and inlet mixer. 2 wedges had wear. No indications on welds. RB-1, RB-2, RS-8, RS-9, RS-3 (JP 1-10)
	2003	EVT-1	Found 12 pumps with small gaps between

			screw and inlet mixer. No change noticed on wedge wear. No indications on welds.
	2005	EVT-1	Found 7 pumps with gaps between set screw and inlet mixer. Significant change in wear on one wedge. No change noticed on 3 wedges wear. Slight wear on 4 wedge rods. Installed slip joint clamps on all jet pumps.
	2007	EVT-1	Found 2 pumps with gaps between set screw and inlet mixer. Notable change in wear on one wedge. No change noted on 4 wedges. Minor wear noted on 9 wedge rods. No change noted on 4 wedge rods.
	2009	EVT-1, UT	Inspected 100% wedges - evidence of wedge "dropping" minor wear. Some set screw gaps all within allowable. UT on beams NRI, 50% Slip joint clamps NRI, JPSL exit line A loop NRI. Misc mixer, diffuser and adapter welds all NRI.
	2011	VT-1, EVT-1	Inspected 100% wedges - evidence of wedge "dropping" minor wear. Some set screw gaps all within allowable. JPSL exit line B loop NRI. Misc mixer, diffuser and adapter welds all NRI. Recordable indication found on the JP 17/18 RS-9 weld. Wear found on JP 5 beam bolt from loose retainer plate.
	2013	VT-1, EVT-1	Inspected 100% wedges - evidence of wedge "dropping" minor wear. Some set screw gaps all within allowable. No change in indications reported last outage. All RS-9 welds re-examined with no new indications.
		UT	UT examination of all 20 jet pump beams with no recordable indications.
	2015	VT-1, EVT-1	Inspected 100% wedges - evidence of wedge "dropping" minor wear. Some set screw gaps all within allowable range. A sample of DF, IN, AD and RB welds

			examined with NRI. All RS-9s examined with no new indications. No change to RS-9 indication on JP-17/18 riser.
	2017	VT-1, EVT-1	Inspected 100% of the wedges - evidence of wedge "dropping" and minor wear. Some set screw gaps were reported but all are within allowable limits. Examined all RS-9 welds with no new indications. No change to RS-9 indication on JP-17/18 riser. With JP-11 removed for maintenance, examined JP-11 slip joint interface region on the mixer & diffuser and examined AS-2 weld from the ID, NRI.
CRD Guide Tube	2003	VT-3, EVT-1	VT-3 of pin and lug EVT-1 of CRGT-2, 3. 10 tubes examined No indications
	2011	VT-3, EVT-1	Completed BWRVIP-47 scope. Nine tubes examined NRI
CRD Stub Tube	2017	VT-3	With JP-11 removed for maintenance, examined accessible CRD Housing and Stub Tube welds at core locations 14-07, 18-03, 22-03 and 26-03, NRI.
In-Core Housing	1985-1997	VT-2	ASME Section XI. No indications.
	1998	VT-2	ASME Section XI. No indications.
	2017	VT-3	With JP-11 removed for maintenance, examined In-Core Housing welds at core locations 16-09, NRI.
Dry Tube	1987-1997	VT-1	Various degrees of erosion. Evaluated acceptable
	1998	VT-1	No unacceptable indications noted
	2001	VT-1	No unacceptable indications noted
	2005	VT-1	No unacceptable indications noted
	2009	VT-1	NRI Two not fully seated

	2013	VT-1	Recordable indications found on one IRM in HAZ near flow hole.
	2015	VT-1	Examined sample of dry tubes IRM/SRM and LPRM per GE SIL (NRI).
	2017	VT-1	Examined sample of dry tubes IRM/SRM and LPRM per GE SIL, NRI.
Instrument Penetrations	1994	VT-2	ASME Section XI. No indications
	2005	VT-2	ASME Section XI. No indications
Vessel ID Brackets	1994	VT-1	ASME Section XI. No indications
	2001	EVT-1	FW brackets. NRI (BWRVIP-48)
	2003	EVT-1	Jet Pump & Core Spray NRI
	2005	EVT-1, VT-1, VT-3	Jet Pump, FW, Core Spray, Sample Holder and Steam Dryer Support Lugs. Existing wear from moving dryer showed no change from earlier outages. Surv. sample holder NRI
	2011	EVT-1	Jet Pump and Core Spray Attachment welds NRI
	2015	EVT-1, VT-1, VT-3	Examined Jet Pump, FW, Core Spray, Sample Holder, Steam Dryer Support Lugs and Steam Dryer Hold Down Lugs. Minor wear on Support Lugs from dryer motion all others had NRI.
	2017	VT-3	Routine examination of Surveillance Sample Holders for engagement. Found holder basket at 300 degree azimuth had separated from the holder tube. All pieces were retrieved and placed in spent fuel pool.
LPCI Coupling	1994	VT-1	ASME Section XI. No indications
	2003	EVT-1	Inspected NRI (BWRVIP-42)
	2009	EVT-1, VT-1	NRI

	2011	EVT-1, VT-1	NRI
	2015	EVT-1, VT-1	Examined one of three LPCI Couplings (NRI).
Steam Dryer	2005	EVT-1, VT-1	One tie bar to hood weld found 2 fatigue cracks. Stop drilled. IGSCC cracks found in base material near welds of 3 vertical hood welds. Damage associated with installing dryer found on 0 degree lower guide bracket.
	2007	EVT-1, VT-1	Tie bars inspected NRI. No additional crack propagation from prior stop drill repair. Additional IGSCC cracks found in base material near vertical hood weld. Similar to 2005 findings. Visible in '05 video review but not recorded.
	2009	VT-1	No change in previous indications
	2011	VT-1	No change in previous indications
	2015	VT-1	10 year re-baseline examination. No change in previous indications. Two new indications reported on lifting rod brackets and minor mechanical damage reported on the 180 degree lower guide bracket.
	2017	VT-1	Re-examination of 2015 indications, no discernable change.
Steam Separator	2009	VT-1, VT-3	100% Exhaust pipes and top tie bars two minor dents, 25% gusset and rings NRI. 36 Shroud Head Bolts some pin wear.
	2011	VT-1, VT-3	Examined 25% gusset, rings and dome with NRI. Shroud Head Bolt pin and window wear from last outage re-examined with no change in wear.
	2013	VT-1, VT-3	Sampled gusset, ring and dome welds with no recordable indications.

	2015	VT-1, VT-3	Examined a sample of the gusset, ring and dome welds (NRI).
	2017	VT-1, VT-3	Sampled gusset and ring welds, NRI.
DM Safe End Welds	2009	UT	BWRVIP-75-A automated UT, six Category C DM welds inspected. All contain Alloy 82/182. One required surface conditioning. No recordable indications.
	2011	UT	BWRVIP-75-A automated UT. Examined four Category C DM welds containing Alloy 82/182. No surface conditioning required. Three with no recordable indications, one with a reflector evaluated as acceptable per ASME Section XI.
	2015	UT	Examined two Category C and two Category A DM welds containing Alloy 82/182 per ASME Section XI. 100% coverage on three, limited coverage on one due to weld configuration (NRI).

Reactor Internals Inspection History

Plant: **Fermi Unit 2**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud (BWRVIP-07/76)	RF04	VT-1 (1mil wire)	Inspected: 100% ID welds H2, H3, and, H4; 100% OD welds H1-H7; accessible areas H8 & H9
		VT-1/ VT-3	The only indications identified were two <1" vertical in orientation above the H2 weld at azimuth 125 degrees. These were evaluated against established flaw screening criteria and found acceptable.
	RF05	EVT-1 (1/2mil wire)	Inspected approximately 60-70 degrees arc on the core shroud in area of previous indications. H2-H4 inspected on shroud ID, H1-H7 inspected on shroud OD. No new indications, no change observed in previous indications above H2 weld.
	RF06	UT	Performed focused phased array UT examination of the H3, H4, H5 and H7 welds utilizing GE's universal carousel. No indication of cracking was identified.
		EVT-1	A cursory exam was performed on H-3 weld to confirm UT results for information only. No new indications and no change was observed in the previous indication above H2 weld.
	RF07	EVT-1	Reinspected the indication above the H2 weld on the inside of the shroud. No change in appearance. The control rod blade was withdrawn to perform the examination.
	RF09	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support

	RF10	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support
	RF11	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support
	RF12	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support
		UT	Performed phased array UT examination of the H3, H4, H5 and H7 welds from both sides utilizing AREVA's demonstrated technique. No indication of cracking was identified. Inspection coverage exceeded 60% for all welds with coverage spaced around the entire circumference.
	RF13	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support.
	RF14 (10/10)	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support.
	RF15 (04/12)	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support.
	RF16 (2014)	N/A	No inspections performed on the Core Shroud. Inspections were performed on the Shroud Support.
	RF17 (2015)	N/A	No inspections performed.
	RF18 (2017)	UT	Performed phased array UT examination of the H3, H4, H5, H6 and H7 welds from both sides utilizing GEH's demonstrated technique. No indication of cracking was identified. Inspection coverage exceeded 85% for all welds with coverage spaced

			around the entire circumference. Off-axis UT examinations performed on a high fluence zone (~1.36E21 n·cm^2, 57.67° to 80.35°) and low fluence zone (~2.33E20 n·cm^2, 74.18° to 98.87°) near H4 with 5.2% (of 207" diameter) coverages. The GEH technique had been demonstrated but not published in a BWRVIP document at the time of the exam. No relevant indications.
Shroud Support (BWRVIP-38/*104) Access Hole Cover (BWRVIP-180)	RF03	VT-3	Inspected shroud support gusset welds and H8/H9 in conjunction with jet pump inspections. No indications
	RF04	VT-1/ VT-3	Inspected areas in conjunction with jet pumps, included were gusset welds H8 and H9. H8 and H9 welds inspected at 0 and 180 degrees with 1 mil wire. No indications.
	RF05	EVT-1 (1/2 mil)	Inspected sample area 60-70 degree arc plus 180 degrees location on H8, H9, and gussets. No indications.
	RF06	VT-3*	*Inspection performed in conjunction with jet pump inspections. Approximately 50% of the gussets and H8 and H9 welds were inspected. This was a best effort exam which ranged from MVT-1 to VT-3 depending on camera angle and lighting. No cleaning was performed. No indications identified.
	RF07	EVT-1	Inspection performed in conjunction with jet pump inspections. Remaining 50% of the gusset welds were inspected. This was a best effort exam which ranged from EVT-1 to VT-3 depending on camera angle and lighting. (Credited as an EVT-1 exam) No cleaning was performed or needed. No indications identified. The H8 and H9 welds were inspected in detail at 0 and 180 Deg. Azimuth to EVT-1 standards where there were no obstructions.

	RF08	EVT-1	The H8 and H9 welds were reinspected to achieve required coverage. 22% of both welds were inspected and included the areas at 0 and 180 degrees as well as adjacent to Jet Pumps 2 and 3. Accessible areas on Gussets 1, 3, 11, 12, and 22 were inspected. No indications of cracking identified.
	RF09	EVT-1 VT-1	The H8 and H9 welds were inspected adjacent to Jet Pumps 3 and 4(Coverage obtained 1% and 8.3%). Accessible areas on Gussets 2 and 15 inspected (90% coverage on each obtained). Both access hole covers were inspected (VT-1). No indications identified.
	RF10	EVT-1/ VT-1	The H8 and H9 welds were inspected adjacent to Jet Pump 5(Coverage obtained 1% and 8.3%). Accessible areas on Gussets 7 and 8 inspected (70/90% coverage obtained @VT-1 quality, EVT-1 not credited, CARD 05-20378). No indications identified.
	RF11	EVT-1	The H8 and H9 welds were inspected at 0 and 180 degrees as well as several other locations. Coverage obtained was 24% for H8 and 30% for H9. Accessible areas on Gussets 5, 6, 7, 8, 9, 10, 18, and 21 were inspected with 50% to 80% coverage obtained @ EVT-1. No indications identified.
		UT	A portion of the H9 weld was examined from the vessel outside diameter using a manual technique as required by BWRVIP-104. Approximately 19.6% of weld was examined with no indications.
	RF12	EVT-1	Accessible areas on Gussets 4 and 13 were inspected with 55% to 80% coverage obtained using EVT-1. No indications identified. Both Access Hole covers were inspected per draft BWRVIP -180

			requirements. Cracking identified on 0 degree cover. Reference OE 25794.
	RF13	EVT-1	Accessible areas on Gussets 5 and 6 were inspected with 75% coverage obtained using EVT-1. No indications identified. The O Degree Access Hole cover was reinspected and no additional cracking was identified. No repair installed.
	RF14 (10/10)	EVT-1	Accessible areas on Gussets 1, 21, and 22 were inspected with 50% - 60% coverage obtained using EVT-1. No indications identified. All 3 welds on the 0 Degree Access Hole Cover were reinspected and no additional cracking was identified. No repair installed.
	RF15 (04/12)	EVT-1	Accessible areas on Gussets 4, 5, 6, 13, 16, and 17 were inspected with 50% to 70% EVT-1 coverage obtained. No indications identified. The H8 and H9 welds were EVT-1 visually inspected from the annulus side with combined coverage at several locations of 15.9% for the H8 weld and 20.5% for the H9 weld. No indications identified.
	RF16 (2014)	EVT-1	Accessible areas on Gussets 11 and 12, as well as the 180° Access Hole Cover were inspected with 90% coverage and no indications were identified. All 3 welds on the 0° Access Hole Cover were re-inspected. No additional cracking was identified and the component was evaluated to be acceptable without repair.
	RF17 (2015)	EVT-1	Accessible areas on Gussets 14, 15, and 18, were inspected with 35% to 65% coverage and no indications were identified.
	RF18 (2017)	EVT-1	Accessible areas on Gussets 7, 8, 9, and 10 were inspected with 30% to 60% coverage and no indications were identified. The 0° Access Hole Cover was

			inspected with 80% coverage with no changes in relevant indication status.
Core Spray Piping (BWRVIP-18/18-A)	each outage RF01 thru RF04	VT-1 (1mil)	During RF-01 two small arc strikes were identified on loop piping. These have been reinspected each outage. No change in condition. Inspections performed per IEB 80-013 and SIL 289. No indication of cracking.
	RF05	EVT-1 (1/2mil) VT-1	All welds brushed prior to inspection using 1/2 mil wire. Remainder of loop piping inspected without brushing. No indication of cracking.
	RF06	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards as opposed to BWRVIP-18 requirements of MVT-1. Cleaning assessment was performed – cleaning was not necessary. No indication of cracking.
	RF07	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards. Cleaning assessment was performed – cleaning was not necessary. No indication of cracking.
	RF08	EVT-1	Inspected all welds on both loops of core spray to EVT-1 standards. Cleaning assessment was performed, cleaning was not necessary. No indication of cracking.
	RF09	EVT-1	Inspected all target welds on both loops of core spray and sample welds on Div 2 to EVT-1 standards. Cleaning assessment was performed, cleaning was not necessary. No indications of cracking.
	RF10	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 2 to EVT-1. Cleaning assessment was performed, cleaning was necessary for selected locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >80%.

	RF11	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 1 to EVT-1. Cleaning assessment was performed, cleaning was necessary for selected locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >80%.
	RF12	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 1 to EVT-1. Cleaning assessment was performed, cleaning was necessary for selected locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >55%.
	RF13	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 2 to EVT-1. Cleaning assessment was performed, cleaning was necessary for selected locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >55%.
	RF14 (10/10)	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 2 to EVT-1. Cleaning was performed for all locations and welds were hydrolazed or brushed. No indications of cracking. Inspection coverage reported separately but generally >60%.
	RF15 (4/12)	EVT-1	Inspected all target welds on both loops of core spray and rotating sample welds on Div 1 to EVT-1. Cleaning was performed for all locations and welds were brushed. No indications of cracking. Inspection coverage reported separately but generally >60%.
	RF16 (2014)	EVT-1	Inspected all target welds on both loops of core spray and a rotating sample welds on

			Div 1 with no indications of cracking observed. Brushing was performed on all locations. Inspection coverage is reported separately in Att. 2, but averaged 58%.
	RF17 (2015)	EVT-1	Inspected all target welds on both loops of core spray and a rotating sample welds on Div 2 with no indications of cracking observed. Brushing was performed on all locations. Inspection coverage is reported separately in Att. 2, but averaged 60%.
	RF18 (2017)	EVT-1	Inspected a sample of welds on both loops with no indications of cracking observed. Brushing was performed on all locations. Inspection coverage averaged 70%.
Core Spray Sparger (BWRVIP-18/18-A)	each outage RF01-RF04	VT-1 (1 mil)	During RF01 one arc strike identified on upper CS sparger. Reinspections have not identified any changes. No indication of cracking
	RF05	VT-1/ EVT-1 (1/2mil)	1/2 mil wire used for junction box remainder utilized 1mil wire. No indication of cracking.
	RF06	EVT-1, 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.
	RF07	EVT-1/ VT-1	Inspected per BWRVIP-18 using EVT-1 for sparger T-box welds, end cap welds, drain plug welds, and support brackets and welds, and VT-1 for flow nozzles and tack welds. No indications of cracking identified.
	RF08	EVT-1/ VT-1	Inspected per BWRVIP-18 using EVT-1 for S1, S2 and S4 welds. Selected S3a, S3b welds inspected using VT-1. Selected S3c welds as well as selected SB bracket welds were inspected using EVT-1 technique. A best effort exam was performed on all accessible areas. No indications of cracking identified.

	RF09	EVT-1/ VT-1	Inspected per BWRVIP-18 using EVT-1 for 50% of the S1, S2 and S4 welds and VT-1 for 50% of the S3a, S3b and S3c welds on the same spargers. 9 SB bracket welds were inspected using EVT-1 technique. Coverage for specific welds will be reported separately. No indications of cracking were identified.
	RF10	EVT-1/ VT-1	Inspected per BWRVIP-18 using EVT-1 for 50% of the S1, S2 and S4 welds and VT-1 for 50% of the S3a, S3b and S3c welds on the same spargers. 6 SB bracket welds were inspected using EVT-1 technique. Coverage for specific welds will be reported separately but was > 60% for welds and >85% for brackets. No indications of cracking were identified.
	RF11	EVT-1/ VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the same spargers. 6 SB bracket welds were inspected using VT-1 technique. Coverage for specific welds will be reported separately but was > 50% for welds and >75% for brackets. No indications of cracking were identified
	RF12	EVT-1/ VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the same spargers. 6 SB bracket welds were inspected using EVT-1 technique. Coverage for specific welds will be reported separately but was > 40% for welds and >75% for brackets. No indications of cracking were identified.
	RF13	EVT-1/ VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the same spargers. 6 SB bracket welds were inspected using EVT-1 technique. Coverage for specific welds will be reported separately but was > 50% for welds and >70% for brackets. No indications of cracking were identified.

	RF14 (10/10)	EVT-1/ VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the C and D spargers. 6 SB bracket welds and S3 nozzle welds were inspected using VT-1 technique. Coverage for specific welds will be reported separately but was > 40% for welds and >60% for brackets. No indications of cracking were identified.
	RF15 (4/12)	EVT-1/ VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the A and B spargers. 6 SB bracket welds inspected using VT-1 technique. Coverage for specific welds will be reported separately but was > 40% for welds and >60% for brackets. No indications of cracking were identified.
	RF16 (2014)	EVT-1/ VT-1	Inspected per BWRVIP-18-A using EVT-1 for 50% of the S1, S2 and S4 welds on the A and B spargers. 6 SB bracket welds were inspected using VT-1. Coverage for specific welds is reported separately in Attachment 2 but was > 40% for most welds and > 60% for most brackets. No indication of cracking was identified.
	RF17 (2015)	EVT-1/ VT-1	Inspected 50% of the S1, S2 and S4 welds on the A and B spargers using EVT-1 and 6 sparger bracket welds using VT-1. Coverage for specific welds is reported separately in Attachment 2 but averaged 46% for the welds and 50% for the brackets. No indication of cracking was identified.
	RF18 (2017)	VT-1	Inspected 3 sparger bracket welds using VT-1 with 50% coverage each. No indication of cracking was identified.
Top Guide (Rim, etc.) Beams (BWRVIP-26) (BWRVIP-183)	RF03	VT-1/ VT-3	Inspected 6 locations (RICSIL 059) and rim area 0° and 180°. No indications.

	RF04	VT-1/ VT-3	Inspected 6 locations (SIL 554) and rim area 0° and 360°. No indications.
	RF05	VT-1	Inspected 15 locations (SIL 554). No indications.
	RF06	VT-1	Inspected bottom edge of beams at 11 core locations per SIL 554. No indication of cracking.
	RF07	VT-1	Inspected bottom edge of beams at 8 core locations per SIL 554. No indication of cracking.
	RF08	VT-1	Inspected bottom edge of beams at 5 core locations per SIL 554. No indication of cracking.
	RF09	VT-1	Inspected bottom edge of beams at 6 core locations per SIL 554. No indication of cracking.
	RF10	VT-1/ VT-3	Inspected bottom edge of beams at 2 core locations per SIL 554 and rim area 0° and 90°. No indication of cracking.
	RF11	VT-1/ VT-3	Inspected bottom edge of beams at 2 core locations per SIL 554. No indication of cracking. Inspected 90 degree segment of top guide rim (90° - 180°) and no indications were identified.
	RF12	VT-1/ VT-3	Inspected intersection and bottom edge of beams at 5 core locations per SIL 554. No indication of cracking.
	RF13	EVT-1	Inspected intersection and bottom edge of beams at 5 core locations per BWRVIP-183 utilizing a new visual inspection tool and rim area 0° - 90°. No indication of cracking.
	RF14 (10/10)	VT-3	Inspected rim area 0° - 180° with no indications identified.

	RF15 (4/12)	EVT-1	Inspected intersection and bottom edge of beams at 5 core locations per BWRVIP-183 utilizing a new visual inspection tool. No indication of cracking. Fabrication related conditions identified on the bottom surface of the plate material at 3 cell locations. Inspected the rim area 180° - 360° with no indications.
	RF16 (2014)	N/A	No inspections performed in RF16.
	RF17 (2015)	EVT-1	Inspected intersection and bottom edge of beams at 9 core cell locations per BWRVIP-183 with no indication of cracking.
	RF18 (2017)	N/A	No inspections performed in RF18.
Core Plate Rim Bolts, etc. (BWRVIP-25)	RF05	VT-1 (1mil wire)	Inspected 6 core plate bolts located between 100 and 160 degrees and adjacent area. No indications.
	RF06	VT-3	Inspected tops of approximately 20 bolts per SIL 588. No indications identified.
	RF07	VT-3	Inspected tops of approximately 20 bolts per SIL 588. No indications identified.
	RF08	VT-3	Inspected tops of approximately 20 core plate bolts (VT-3) per SIL 588. Did not meet BWRVIP requirements. No indications identified.
	RF09	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2003-117 and TJ-2003-01)
	RF10	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2003-117 and TJ-2003-01)
	RF11	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2006-041 and DD-2006-01)

	RF12	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2006-041)
	RF13	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2006-041)
	RF14 (10/10)	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. (Reference BWRVIP 2006-041) BWRVIP 2010- 243 now requires preparation of a Deviation Disposition by 3/31/2011.
	RF15 (4/12)	N/A	No inspections performed. BWRVIP analysis concluded that inspections are not required. Deviation Disposition DD-2011-01 was submitted to BWRVIP 3/30/2011.
	RF16 (2014)	N/A	No inspections performed in RF16, as justified by Deviation Disposition DD-2011-01.
	RF17 (2015)	N/A	No inspections performed in RF17, as justified by Deviation Disposition DD-2011-01 Revision 1.
	RF18 (2017)	N/A	No inspections performed in RF18, as justified by Deviation Disposition DD-2011-01 Revision 1.
SLC (BWRVIP-27)	RF04	VT-3	Performed a visual inspection from Reactor penetration to shroud support when access was provided during jet pump beam replacement. No indications.
	RF05 - RF07	N/A	No inspections performed as access was not provided.
	RF08	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, but did not remove mirror insulation box from safe-end. No leakage observed.
	RF09	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the

			safe-end for direct inspection. No leakage observed.
	RF10	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF11	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF12	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF13	VT-2*/UT	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed. Performed a manual PDI qualified ultrasonic inspection of the nozzle to safe end weld as well as additional base material of bored material. No indications identified.
	RF-14 (10/10)	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF-15 (4/12)	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF16 (2014)	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the

			safe-end for direct inspection. No leakage observed.
	RF17 (2015)	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
	RF18 (2017)	VT-2*	Performed enhanced inspection on nozzle area from inside skirt area, and removed cover on the mirror insulation box for the safe-end for direct inspection. No leakage observed.
Jet Pump Assembly (BWRVIP-41)	Each outage examine at least 50% thru RF05	VT-1, VT-3	Jet pump assemblies are inspected each outage from top to bottom. During RF-04 all (20) hold down beams were replaced as a preventative measure and to avoid performing UT's on the old style/original beams. Inspections are performed to the recommendations of SIL 551, 574, 465 S-1, and RICSIL 078. During RF05 one of the 80 restrainer screw tack welds was found to be cracked. This was evaluated and was not repaired during RF05.
	RF06	MVT-1, VT-3	Performed inspections to the intent of BWRVIP-41 as well as augmented VT-3 of selected areas on jet pumps 1-10. Inspections included all High, Medium and Low Priority locations. Inspected RS-1 and RS-2 welds on jet pumps 11-20. One indication identified on RS-1 weld, 1.75" long. JCO performed prior to start-up. No other new indications identified.
	RF07	EVT-1	Performed inspections to the intent of BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected areas on jet pumps 11-20. Inspections included all High, Medium and Low Priority locations. Reinspected previously identified indication on RS-1 weld, 1.75" long that was identified in RF06. No change in indication length or

			appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. No other indications or changes in previous indications identified.
	RF08	EVT-1	Performed reinspections to the intent of BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected areas on jet pumps 1& 2. Inspections included all High, Medium and Low Priority locations. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7&8 that was identified in RF06. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 jet pumps per recommendations of SIL 629 and verified no wedge damage (WD-1) as well as full contact with restrainer screws. No damage identified on any location. Reinspected all restrainer screw tack welds with no changes observed.
	RF09	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected areas on Jet Pumps 3 & 4. Inspections included all High, Medium and Low Priority locations. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7&8 that was identified in RF06. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 Jet Pump Hold Down Beams by UT for BB1, BB2, and the transition area BB3 using the latest available technique from General Electric. No indications identified on the beams. Reinspected all restrainer screw tack welds, contact area, and wedges after both tack welds on Jet Pump 15 were found cracked. No other damage or indications identified on any

			location. Jet Pump 15 permanently repaired by the installation of an auxiliary spring wedge. (Reference CARD 03-16929)
	RF10	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on Jet Pumps 4, 5, 6, 7, & 8. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7 & 8 that was identified in RF06. No change in indication length / appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Reinspected auxiliary spring wedge on Jet Pump 15. No other damage or indications identified on any location.
	RF11	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on Jet Pumps 7, 8, 9, & 10. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7 & 8 that was identified in RF06. No change in indication length / appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all Jet Pump wedges after wear was identified on JP2 restrainer bracket. Performed inspection of other welds on Jet Pump 2 as required by BWRVIP-41. Auxiliary spring wedges installed on Jet Pumps 1 and 2 and a slip joint clamp was installed on Jet Pump 2 to restore integrity. No other damage or indications identified.
	RF12	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on Jet Pumps 7, 8, 9, 10, 11, & 12. Reinspected previously identified 1.75" long indication on RS-1 weld for Jet Pumps 7 & 8 that

			was identified in RF06. No change in indication length / appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 Jet Pump Hold Down Beams. Inspected 12 Jet Pump wedges including the wedges and hardware (auxiliary spring wedges and slip joint clamp) installed in RF11. No other damage or indications identified.
	RF13	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on Jet Pumps 7, 8, 9, 10, 13, 14, 15, and 16. Reinspected previously identified indication on RS-1 weld for Jet Pumps 7/8 identified in RF06. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected 9 Jet Pump wedges. No other damage or indications identified.
	RF14 (10/10)	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1 and VT-3's of selected welds on most Jet Pumps including RS-8/9 welds on all pumps. Reinspected previously identified indication on RS-1 weld for Jet Pumps 7/8. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as acceptance limit. Inspected all 20 Jet Pump wedges. Minor movement noted but no other damage or indications identified.
	RF15 (4/12)	EVT-1	Performed reinspections to BWRVIP-41 including EVT-1's as well as augmented VT-1's of selected welds on several Jet Pumps. Reinspected previously identified indication on RS-1 weld for Jet Pumps 7/8. No change in indication length or appearance. Existing Flaw Evaluation on hand prepared by GE referenced as

			acceptance limit. Inspected all 20 Jet Pump wedges. No movement noted and no damage or indications identified.
	RF16 (2014)	EVT-1/ VT-1	Performed EVT-1 exams of selected welds in accordance with BWRVIP-41 Rev. 3 with no indications identified. VT-1 exams performed on all 20 main wedge assemblies. Wedge wear identified on Jet Pump 06; scope expansion performed with no further relevant indications observed and wedge was evaluated to be acceptable without repair. Growth identified during re-inspection of indication on RS-1 weld for Jet Pumps 07/08. Indication was evaluated to be acceptable for two cycles without repair. Ultrasonic examination of all 20 Jet Pump Hold Down Beams (BB1, BB2 and BB3). No indications identified on the beams.
	RF17 (2015)	EVT-1/ VT-1	Performed EVT-1 exams of selected welds with no indications identified. VT-1 exams performed on all 20 main wedge assemblies. Minor wedge rod wear identified on Jet Pump 01; evaluated to be acceptable without repair. Minor wear identified on Jet Pump 02 Auxiliary Wedge, scope expansion performed with no further relevant indications observed and evaluated to be acceptable without repair. Mitigating clamp installed on the RS-1 weld for Jet Pumps 07/08.
	RF18 (2017)	EVT-1	Performed EVT-1 exams of selected welds with no indications identified. VT-1 exams performed on all 20 main wedge assemblies. Jet Pump 01 Wedge Rod wear obscured by wedge position shift; scope expansion performed with no further relevant indications observed and evaluated to be acceptable without repair.
Jet Pump Diffuser (BWRVIP-41)	Each outage	VT-3	Diffusers will be sample inspected during refueling outages.

	RF06	MVT-1	BWRVIP-41 on Jet Pumps 1-10 except inaccessible areas. No cracking.
	RF07	EVT-1	BWRVIP-41 on Jet Pumps 11-20 except inaccessible areas. No cracking identified. Welds DF-3, AD-1, and AD-2 are inaccessible for inspection.
	RF08	EVT-1	BWRVIP-41 reinspection on Jet Pumps 1 and 2 except inaccessible areas. No cracking identified. Welds DF-3, AD-1, and AD-2 are inaccessible for inspection.
	RF09	EVT-1	BWRVIP-41 reinspection on Jet Pumps 3 and 4 except inaccessible areas. No cracking identified. Welds DF-3, AD-1, and AD-2 are inaccessible for EVT-1 visual inspection, VT-3 performed. (TJ-2003-02 prepared as justification)
	RF10	EVT-1	BWRVIP-41 reinspection of selected DF-1 and DF-2 welds on Jet Pumps 5, 6, 7, & 8. Performed access study for future performance of UT examinations of welds DF-3, AD-1, and AD-2. These welds are inaccessible for visual inspection. VT-3 performed. No indications identified (Reference TJ-2003-02)
	RF11	EVT-1	BWRVIP-41 reinspection of selected DF-2 welds on Jet Pumps 9 & 10.
		UT	Performed of UT examinations on a portion of a total of 17 DF-3, AD-1, and AD-2 welds using specialized tooling. These welds are inaccessible for visual inspection. No indications identified (Reference DD-2006-02)
	RF12	EVT-1	BWRVIP-41 reinspection of selected DF-1 and 2 welds on Jet Pumps 6, 11, & 12.
		UT	No UT examinations performed during RF12 due to tooling failures. These welds

			are inaccessible for visual inspection. (Reference DD-2006-02)
	RF13	EVT-1	BWRVIP-41 reinspection of selected DF-1 and 2 welds on Jet Pumps 7, 13, & 14.
		UT	No UT examinations performed during RF13 due to tooling failures. These welds are inaccessible for visual inspection. (Reference DD-2006-02)
	RF14 (10/10)	EVT-1	BWRVIP-41 reinspection of selected DF-1 and 2 welds on Jet Pumps 7, 8, 9, and 13-18. No indications identified.
		UT	Completed baseline UT examinations on all 20 Jet Pumps Diffuser/Adapter DF-3, AD-1 and AD-2 welds, (60 welds) since these welds are inaccessible for visual inspection. Deviation Disposition is no longer needed.
	RF15 (4/12)	EVT-1	BWRVIP-41 reinspection of selected DF-1 and 2 welds on Jet Pumps 10, 19, and 20. No indications identified.
	RF16 (2014)	EVT-1	BWRVIP-41 re-inspection of selected DF-1 and 2 welds on Jet Pumps 01, 02, and 11. No indications identified.
	RF17 (2015)	EVT-1	BWRVIP-41 re-inspection of selected DF-1 and 2 welds on Jet Pumps 03, 04, and 12. No indications identified.
	RF18 (2017)	EVT-1	BWRVIP-41 re-inspection of selected DF-1 and 2 welds on Jet Pumps 05, 06, 07, 08, 13, and 14. No indications identified.
		UT	UT performed on DF-3, AD-1, and AD-2 on Jet Pumps 01, 02, 03, 04, 07, 08, 17, 18, 19, 20 with no relevant indications observed.
CRD Guide Tube (BWRVIP-47)	RF04	VT-3	Inspected lower portion of peripheral guide tubes and stub tubes when access

			was provided during jet pump hold down beam replacement. No indications identified.
	RF07	EVT-1 and VT-3	Performed best effort exam on CRGT-3 as weld was not visible on inside of tube. CRGT-2 not accessible due to flow and ARPIN was not felt to be accessible. No indications identified.
	RF08	EVT-1 and VT-3	Performed best effort exam on CRGT-3 as weld was not visible on inside of tube. CRGT-2 not accessible due to flow and FS/GT-ARPIN was not felt to be accessible. No indications identified.
	RF09	EVT-1 and VT-3	Performed exams on CRGT-1, CRGT-2, CRGT-3, and FS/GT-ARPIN at 10 Control Rod Guide Tubes/locations. No indications identified.
	RF10 RF11	N/A N/A	No inspection performed in RF10. No inspection performed in R11.
	RF12	VT-3	Performed exams on CRGT-1 and FS/GT-ARPIN at 5 Control Rod Guide Tubes/locations. CRGT-2 and CRGT-3 not performed or credited due to high flow conditions. No indications identified.
	RF13	N/A	No inspections performed in RF13.
	RF14 (10/10)	EVT-1 and VT-3	Completed all remaining baseline inspections on the Control Rod Guide Tubes. Inspections performed on (4) CRGT-1, and FS/GT-ARPIN locations and on (9) CRGT-2 and CRGT-3 locations. One manufacturing flaw identified that did not impact the functionality of the component.
	RF15 (4/12)	N/A	No BWRVIP required inspections performed in RF15.
	RF16 (2014)	N/A	No BWRVIP required inspections performed in RF16.

	RF17 (2015) RF18 (2017)	N/A N/A	No BWRVIP required inspections performed in RF17. No BWRVIP required inspections performed in RF18.
CRD Stub Tube * (BWRVIP-47)	RF04	VT-3	Inspected lower portion of peripheral guide tubes and stub tubes when access was provided during jet pump hold down beam replacement. No indications identified.
In-Core Housing * (BWRVIP-47)	RF04	VT-3	Small portion visible during jet pump beam replacement. No indication of degradation.
Dry Tube * (BWRVIP-47)	Each outage RF06 RF07 RF08 RF09 RF10 RF11	VT-1 VT-1 VT-1 VT-1 N/A VT-1 VT-1	9 of 12 tubes found not completely seated. Performed all inspections per SIL 409 and RICSIL 073. No indications of cracking. Reinspected 12 dry tubes. No change from previous condition. No cracking. Inspected all 12 original design Dry Tubes. No change from previous conditions identified. No cracking identified. Inspected all 12 original design Dry Tubes from two sides. No change from previous conditions identified. No cracking identified. No inspections performed in RF09. Inspected all 12 original design Dry Tubes from two sides. Linear indications identified on 7 tubes in the collar region above the pressure boundary weld. Evaluated as acceptable for one cycle of operation. Plan to replace in RF11. (Reference CARD 04-25703) Replaced all 12 Dry Tubes in RF11. Performed baseline VT-1 and verified proper engagement in Top Guide.

	RF12 RF13 RF14 RF15 RF16 (2014) RF17 (2015) RF18 (2017)	N/A N/A N/A N/A N/A N/A N/A	No inspections performed in RF12. No inspections performed in RF13. No inspections performed in RF14. No inspections performed in RF15. No inspections performed in RF16. No inspections performed in RF17. No inspections performed in RF18.
Instrument Penet.* (BWRVIP-49 & 41)	Each outage RF04 RF06 RF07 RF08 RF09 RF10 RF11 RF12 RF13 RF14 RF15	VT-3 VT-3 VT-3 VT-3 VT-3 VT-3 VT-1 VT-1 VT-1 VT-1 VT-1 VT-1	Inspected jet pump sensing lines and brackets each outage. SLC and peripheral bottom head penetrations inspected. No indications. Inspected JP sensing lines for pumps 1-10. No indications. Inspected JP sensing lines for pumps 11 thru 20 only. No indications. Inspected JP sensing lines for Pumps 1 & 2 only. No indications. Inspected JP sensing lines for Pumps 3 & 4 only. No indications. Inspected JP sensing lines for Pumps 5, 6, 7, 16, & 17. No indications Inspected JP sensing lines for Pumps 6, 7, 16, & 17. No indications. Inspected JP sensing lines for Pumps 6, 7, 11, 12, 16, & 17. No indications. Inspected JP sensing lines for Pumps 6, 7, 13, 14, 16, & 17. No indications. Inspected JP sensing lines for Pumps 6, 7, 15, 16, 17, & 18. No indications. Inspected JP sensing lines for Pumps 6, 7, 16, 17, 19, & 20. No indications.

	RF16 (2014)	VT-1	Inspected JP sensing lines for Pumps 1, 2, 6, 7, 16, & 17. No indications.
	RF17 (2015)	VT-1	Inspected JP sensing lines for Pumps 3, 4, 6, 7, 16, & 17. No indications.
	RF18 (2017)	VT-1	Inspected JP sensing lines for Jet Pumps 05, 06, 07, 08, 16, & 17 with no relevant indications noted.
Vessel ID Brackets (BWRVIP-48)	Each outage	VT-1/3	Inspect sample population each outage. We have inspected most brackets each outage (core spray, feedwater). Jet pump riser brace, steam dryer support lugs, guide rod brackets and specimen holder brackets are sample inspected. No indications of cracking identified.
	RF06	MVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket 1 specimen bracket. No indication of cracking.
	RF07	EVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket No indication of cracking identified.
	RF08	EVT-1	6 feedwater brackets. All core spray piping brackets. 4 steam dryer brackets 1 guide rod bracket Surveillance holder and Brackets @ 30 az. No indication of cracking identified.
	RF09	EVT-1	6 Feedwater brackets. 4 Core Spray piping brackets. 1 Jet Pump riser brace (Jet Pump 3 and 4) No indication of cracking identified.
	RF10	EVT-1	6 Feedwater brackets. 3 Core Spray piping brackets.

			1 Surveillance Holder bracket 4 Steam Dryer Support brackets 4 Steam Dryer Hold Down 1 Guide Rod Bracket 1 Jet Pump riser brace (Jet Pump 5 and 6) No indication of cracking identified.
	RF11	EVT-1/ VT-1	No inspections performed in RF-11.
	RF12	EVT-1/ VT-1	6 Feedwater Sparger bracket sets. 1 Surveillance Holder bracket 4 Steam Dryer Support brackets 1 Guide Rod Bracket 2 Jet Pump riser braces (Jet Pumps 7, 8, 9, & 10) No indication of cracking identified.
	RF13	EVT-1/ VT-1	No inspections performed in RF-13.
	RF14 (10/10)	EVT-1/ VT-1	3 Feedwater Sparger bracket sets. 2 Core Spray Piping Brackets 1 Surveillance Holder bracket 4 Steam Dryer Support brackets 1 Guide Rod Bracket 2 Jet Pump riser braces (Jet Pumps 1/ 2, and 11/12) No indication of cracking identified.
	RF15 (4/12)	EVT-1/ VT-1	Inspections performed on 3 Feedwater Sparger bracket sets and 1 Guide Rod Bracket. No indications identified.
	RF16 (2014)	EVT-1/ VT-1	Inspection performed on 1 Surveillance Sample Holder Bracket. No indications identified.
	RF17 (2015)	EVT-1 / VT-1	2 Feedwater Sparger bracket sets (four individual brackets) 4 Core Spray Piping Brackets 4 Steam Dryer Support Brackets 4 Steam Dryer Holddown Brackets 1 Guide Rod Bracket 1 Jet Pump Riser Brace. No indication of cracking identified.

	RF18 (2017)	EVT-1/ VT-1	3 Feedwater Sparger bracket sets (six individual brackets) 1 Surveillance Holder Bracket 1 Guide Rod Bracket 1 Jet Pump Riser Brace. No indication of cracking identified.
LPCI Coupling	N/A	N/A	Fermi does not have a LPCI Coupling
Shroud Head Bolts/Shroud Head	RF04	UT/VT	16 had indications, 17 replaced during RF04.
	RF05	N/A	Remaining bolts replaced (31) during RF05 as a preventative measure. All 48 are now new style.
	RF06	VT-3	Bolts 1-24 (of 48). No indication of cracking.
	RF07	VT-3	Bolts 25-48 (of 48). No indication of cracking or damage. Springs were left compressed on 20 of the 24 inspected.
	RF08	VT-3	Bolts 1-24 (of 48). No indication of cracking or damage
	RF09	VT-3	Bolts 23 and 25-48 (of 48). No indication of cracking or damage. All retainer springs verified to be functioning properly.
	RF10	VT-3	Bolts 1-24 (of 48). Inspected North 1/3rd of Shroud Head/Separator and 2 lifting lugs. No indication of cracking or damage
	RF11	VT-3	Inspected Bolts 25-48 (of 48) and inspected Center 1/3rd of Shroud Head/Separators. No indication of cracking or damage.
	RF12	VT-3	Bolts 1-24 (of 48). Inspected South 1/3rd of Shroud Head/Separator and 2 lifting lugs. All mid support ring gussets were inspected and small short cracks were identified on 3 of the 24 gussets. No

			repairs were required. Ref. OE 25795.
	RF13	VT-3	Bolts 25-48 (of 48). Inspected North 1/3rd of Shroud Head/Separator and 2 lifting lugs. No changes identified in previous indications identified in RF12. No other indications identified.
	RF14 (10/10)	VT-3	Bolts 1-24, 27, 30, & 33 (of 48). Inspected Center 1/3rd of Shroud Head/Separator. No changes identified in previous indications and no new indications identified.
	RF15 (4/12)	VT-3	Inspected Bolts 25-48 and 2 (of 48). Inspected South 1/3rd of Shroud Head/Separator. No changes identified in previous gusset indications and no new indications identified.
	RF16 (2014)	VT-3	Inspected Bolts 1-12 (of 48) and the North 1/3rd of Shroud Head/Separator. No new indications were identified.
	RF17 (2015)	VT-3	Inspected bolts 13-24 (of 48). Minor pin & window wear identified on bolts 21 & 23, evaluated to be acceptable without repair. Replaced bolts 2 & 33 due to their inability to latch. Inspected the Center 1/3rd of the Separator and identified one tie bar with a severed attachment weld on one end. The tie bar was removed to preclude generation of a loose part (technical justification from OEM obtained to support acceptance of one missing tie bar).
	RF18 (2017)	VT-3	Reinspected bolts 21 & 23 with no change in condition recorded. Normal inspections included bolts 25-36. Minor pin wear on bolts 31 & 35; evaluated acceptable without repair. Pin and window wear observed on bolts 34 & 36; evaluated acceptable without repair. No other indications.

Steam Dryer (RF01-RF-08 not previously reported)	RF09	VT-3	Inspected approximately 1/3 of dryer including hood welds and cover plate welds. (Ref. SIL 644) No indications of additional cracking identified.
	RF10	VT-1/ VT-3	Inspected approximately 50% of dryer including all inner hood vertical welds as recommended in SIL 644, Supplement 1, and Revision 1). Several new indications were identified near welds due to new locations being inspected and the change in technique. Indications were noted at base of inner hood vertical welds. Reference CARD 04-25416 and also OE #17600. No changes were identified on previously recorded indications.
	RF11	VT-1/ VT-3	Inspected approximately 50% of dryer including all inner hood vertical welds as recommended in SIL 644, Revision 1 and BWRVIP-139. Several new indications were identified near welds due to new locations being inspected and the change in technique. Indications previously noted on hood welds in RF10 were reinspected and no changes were noticed.
	RF12	VT-1/ VT-3	Inspected approximately 50% of dryer including inner hood vertical welds as recommended in BWRVIP-139. Several new small indications were identified near welds due to new locations being inspected and the change in technique and camera angles used. Indications previously noted on hood welds were reinspected and no changes were noticed.
	RF13	VT-1/ VT-3	Inspected approximately 20% of dryer including "F" Bank welds and a sampling of other locations following reinspection guidelines contained in NRC SE to BWRVIP-139. One new indication identified in support ring.
	RF14 (10/10)	VT-1/ VT-3	Inspected approximately 20% of dryer including "E" Bank welds and a sampling

			of other locations following reinspection guidelines contained in BWRVIP-139-A. No new indications identified.
	RF15 (4/12)	VT-1/ VT-3	Inspected approximately 20% of dryer including "D" Bank welds and a sampling of other locations following reinspection guidelines contained in BWRVIP-139-A. No new indications identified.
	RF16 (2014)	VT-1/ VT-3	Inspected approximately 20% of dryer including "C" Bank welds and a sampling of other locations following reinspection guidelines contained in BWRVIP-139-A. Indication newly identified on interior vane bank weld HE-C-2-1; evaluated to be acceptable without repair.
	RF17 (2015)	VT-1/ VT-3	Inspected approximately 20% of dryer including "B" Bank welds and a sampling of other locations following reinspection guidelines contained in BWRVIP-139-A. Indication on interior vane bank weld HE-C-2-1 identified in RF16 re-inspected with no changes observed. 24 capture plate assemblies installed to cover all tie rod nut washer locations. Vertical drain channel welds preemptively increased from 1/8" to 1/4".
	RF18 (2017)	VT-1/ VT-3	Inspected approximately 20% of dryer including "A" Bank welds and a sampling of other locations following reinspection guidelines contained in BWRVIP-139-A. Indication on interior vane bank weld HE-C-2-1 identified in RF16 re-inspected with no changes observed. 24 capture plate assemblies reinspected with no new indications. New wear at 94° Seismic Support Block at interface with RPV Support Block; evaluated as acceptable without repair.
Dissimilar Metal Welds BWRVIP-75-A (Not previously reported,	RF-12	UT	Performed ultrasonic examinations on 4 Category B DM welds that contain alloy 82/182 using automated PDI qualified

reference BWRVIP letter 2008-089)			techniques and procedures. Since >90% coverage was not obtained on two welds, 2 additional welds were selected and >90% volume coverage was obtained. No indications of cracking identified.
	RF-13	UT	Performed ultrasonic examinations on 5 Category B DM welds that contain alloy 82/182 using automated and manual PDI qualified techniques and procedures. No indications of cracking identified.
	RF-14 (10/10)	UT	Performed ultrasonic examination of 1 Category B DM weld that contained alloy 82/182 using manual PDI qualified technique and procedure. No indications of cracking identified.
	RF-15 (4/12)	UT	Performed ultrasonic examination of 1 Category B DM weld that contained alloy 82/182 using manual PDI qualified technique and procedure. No indications of cracking identified.
	RF16 (2014)	UT	Performed ultrasonic examination of 3 Category B DM welds using manual PDI qualified technique and procedure. No indications of cracking identified.
	RF17 (2015)	UT	Performed ultrasonic examination of 4 Category B DM welds using PDI qualified phased array technique and procedure. No indications of cracking identified.
	RF18(2017)	N/A	No inspections performed in RF18.
Bottom Head Drain Line (BWRVIP-205)	RF16 (2014)	RT	Deviation Disposition DD-2014-01 issued to support not completing radiography on the first elbow and piping immediately downstream of the reactor vessel in RF16. RT was performed on straight piping further downstream with no evidence of flow accelerated corrosion observed.
	RF18 (2017)	RT	Radiograph of first elbow and piping immediately downstream of RPV

			indicates no considerable corrosion wear has occurred. No signs of foreign material blockage. Socket weld fitting gaps remain fully intact. Resolves DD-2014-01.

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

Reactor Internals Inspection History

Plant: **Hatch Unit 2**

Component in BWRVIP Scope	Date of Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Re-inspections
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 degrees. No indications. Future Shroud Tie Rod Inspections not to exceed 10 years.
	2007	EVT-1, VT-3 & Tightness	All Tie Rods – No indications. Upper Supports & Tie Rod Nuts have been determined to be susceptible to IGSCC. This will make corrective action necessary by next outage.
	2009 (2R20)	EVT-1. VT-3.	All four tie rod assemblies modified with replacement component items designed to not be susceptible to IGSCC. All component items replaced with the exception of the lower collet and clevis pin.
	2011 (2R21)	EVT-1, VT-3	Post tie-rod modification inspections on all 4 tie rods were successfully performed with no indications noted.

	2017 (2R24)	EVT-1	No Relevant Indications - Performed examinations on all four (4) Core Plate Seismic Wedges associated with the Shroud Tie Rods (45°, 135°, 225°, and 315°).
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 from the outside surface per BWRVIP-07. No indications.
	2001	EVT-1	Performed EVT-1 examinations from the outside surface for welds V-1, V-2, V-9, V-10, & V-11. No Reportable Indications. These welds are scheduled in approximately six year intervals for single sided coverage per BWRVIP-63
	2005	EVT-1	Performed EVT-1 examinations on the inside & outside surfaces of vertical welds V-3, V-4, V-5, V-6, & V7. Inside surface indication was found on V-6 at the upper intersection (H-4) which parallels H-4. Also examined the outside surfaces of vertical welds V-12, V-13, V-14 with no indications.
	2007	EVT-1	Performed EVT-1 examinations from the outside surface for welds V-1, V-2, V-9, V-10, & V-11. No Reportable Indications. V-6 Inside surface indication was found in 2005 on at the upper intersection (H-4) which parallels H-4. Was reexamined to determine if this indication had changed. No changes were recorded.
	2011 (2R21)	EVT-1	Performed EVT-1 examinations from the outside surface for welds V-12, V-13, and

			V-14. No reportable indications.
	2013 (2R22)	EVT-1	Performed EVT-1 examinations from the outside surface for welds V-1, V-2, V-9, V-10, & V-11. No Reportable Indications.
	2015 (2R23)	EVT-1	Performed EVT-1 examinations from ID and OD on V3, V4, V5, V6, V7, V8. Several reportable indications noted near V3 and V6. Corresponding outside diameter locations were examined with no reportable indications. All indications evaluated as acceptable for return to service per BWRVIP-76 guidance and ASME SCXI rules as applicable.
		VT-3	Performed ASME SCXI VT-3 shroud inside surface exams from shroud flange to support ledge for approximately 270 degrees, and from top guide support ring to shroud flange for 90 degrees. Several reportable indications noted at 3 additional locations from the inside diameter. Corresponding outside diameter inspections revealed no reportable indications. All indications evaluated as acceptable for return to service per BWRVIP-76 guidance and ASME SCXI rules as applicable.
	2017 (2R24)	VT-3	No Relevant Indications - Performed examinations from the OD surface of welds V-12, V-13, and V-14.
Core Shroud Ring Segment Welds	N/A	N/A	Hatch 2 does not have Ring Segment Welds
Core Shroud Support	1995	EVT-1	Horizontal surfaces of Shroud Support Ledge: 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 (2R13)	VT-3	H-9: Examine 0-360° where accessible, from top once/interval. Examined 25% in '97. No indications.

		VT-1/ VT-3	AHC: VT-3 of 0° access hole cover with VT-1 of tack welds. No indications.
	1998 (2R14)	VT-3	H-9: Examined 75% of accessible surfaces from top per BWRVIP-38. No indications.
		VT-1/ VT-3	AHC: VT-3 of 180° access hole cover with VT-1 of tack welds. No indications.
	2000 (2R15)	VT-1/ VT-3	AHC: VT-3 of 0° access hole cover with VT-1 of tack welds. No indications.
	2001 (2R16)	VT-1/ VT-3	AHC: VT-3 of 180° access hole cover with VT-1 of tack welds. No indications.
	2003 (2R17)	VT-1/ VT-3	AHC: VT-3 of 0° and 180°access hole cover with VT-1 of tack welds. No indications.
	2007 (2R19)	VT-3	H-9: Examined 100% of accessible surfaces from top per BWRVIP-38. No indications.
		EVT-1	H-8: EVT-1 of accessible weld surface from the top side of H8.
		VT-1/ VT-3	AHC: VT-3 of 0° and 180° access hole covers with VT-1 of tack welds. No indications.
	2015 (2R23)	VT-1/ VT-3	AHC: VT-3 of 0° and 180° access hole covers with VT-1 of tack welds. No indications.
	2017 (2R24)	VT-3	H-9: No Relevant Indications - Performed examinations on 70% of all accessible surfaces (from top) per BWRVIP-38.
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	Reinspection per BWRVIP-18. No Indications.

	2000	EVT-1	Reinspection per BWRVIP-18. No Indications.
	2001	EVT-1	Reinspection per BWRVIP-18. No Indications.
	2003	EVT-1	Reinspection per BWRVIP-18. No Indications.
	2005	EVT-1	Reinspection per BWRVIP-18. No Indications.
	2007	EVT-1	Reinspection per BWRVIP-18. No Indications.
	2009 (2R20)	EVT-1	Reinspection per BWRVIP-18. No Indications.
	2011 (2R21)	EVT-1	Reinspection per BWRVIP-18-A. No indications.
	2013 (2R22)	EVT-1	Reinspection per BWRVIP-18 Rev. 1-A. No indications.
	2015 (2R23)	EVT-1	Reinspection per BWRVIP-18 Rev. 1-A. No indications.
	2017 (2R24)	EVT-1	No Relevant Indications - Transitioned to BWRVIP-18 Rev. 2-A Inspection Requirements. Performed inspections (EVT-1 and VT-3) of the Core Spray Piping Bracket to RPV Welds at 30° and 210° and inspections (EVT-1) of P4a, P4b, P4c, and P4d Welds at 170°.
Core Spray Sparger	1980-96	VT-1 (.001)	IEB 80-13/NUREG CR-4523. Examined 100% each outage prior to '97. 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.
	1997	CSVT-1	Examined all previously reported Sparger Bracket indications. No change.

	1998	CSVT-1 VT-3 (1/32)	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.
	2000	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.
	2001	EVT-1 VT-1	No new indications. No change in previously reported eight (8) Sparger Brackets indications since1994/1995. Can not clean or get a good close look at these indications to classify.
	2003	EVT-1 VT-1	No new indications. No change in previously reported eight (8) Sparger Brackets indications since1994/1995. Can not clean or get a good close look at these indications to classify.
	2005	EVT-1 VT-1	No new indications. Could not find some of the previously reported sparger bracket indications despite relooks. No change in the observed Sparger Bracket indications since1994/1995. Can not clean or get a good close look at these indications to classify.
	2009 (2R20)	EVT-1 VT-1	New sparger bracket-to-shroud indication at 272°. Previous sparger bracket-to-shroud indications tracked since 1994 remain unchanged. New indication recorded is acceptable and similar to previous indications.
	2011 (2R21)	VT-1	Reinspection of sparger bracket-to-shroud indication at 272 degrees. Additional indications noted in the same area, similar

			to previous indications. This indication is thought to be older, and revealed due to more efficient cleaning methods used for the first time in this area. All other bracket locations were inspected in 2009 with no changes since 1994.
	2013 (2R22)	EVT-1 VT-1 (89)	EVT-1 of all sparger major piping welds (S1, S2, S4). VT-1 (89) of all sparger bracket (SB) locations and 50% of sparger nozzle welds. Newly discovered indication at 330 deg. sparger bracket (weld 50) , bounded by previous evaluations, and similar to findings spring 2011, thought to be older and revealed due to more efficient cleaning methods used for the first time in this area. No changes noted for any other previous indications.
	2015 (2R23)	VT-1 (89)	VT-1 (89) Reinspection of core spray sparger bracket to shroud welds at 272° and 330°. No changes to indications at 272°. Evaluated as acceptable. No indications reported at 330°.
	2017 (2R24)	VT-3	Relevant Indications - Transitioned to BWRVIP-18 Rev. 2-A Inspection Requirements. Reinspection of Core Spray Sparger Bracket to Shroud Welds at 272° and 330° and the remaining sparger bracket locations with previous indications. No discernible changes were noted. New indications were found at 60° (Weld 8), 240° (Weld 36), and 330° (Weld 51). The new indications will be reinspected during the next two (2) refueling outages (2R25 and 2R26).
Top Guide BWRVIP-26, 1997	1992	VT-1 (.001)	Grid/beams: SIL-554, VT-1 (.001) bottom of intersections. Examined 28 cells in '92. No indications.
Hatch 2 Top Guide has wedges	1994	VT-1 (.001)	Grid/beams: SIL-554, VT-1 (.001) bottom of intersections. Examined 10 cells in '94. No indications. Hold downs & aligners: SIL-588, examined 2 of 4 1994. No indications.

	1995	VT-3	Wedges (24): No indications.
	1997	VT-1 (.001) VT-1/3	Grid/beams: SIL-554, VT-1 (.001) bottom of intersections. Examined 6 cells in '97. No indications. Rim, upper/lower plates, bolting: Examined in 1997. No indications.
	2001	VT-1	Hold-downs 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 & extended power up-rate.
	2005	VT-1/3	Grid/beams: SIL-554, Examined 16 cells in '05. No indications. Rim, upper/lower plates, bolting: Examined 50% in 2005. 100% Grid Beams VT-3 from top surfaces. No indications. Hold-downs and attachments to the shroud (2 of 4) 180° apart every other outage. No relevant indications.
	2007	VT-1	Grid/beams: SIL-554, Examined bottom surfaces of 14 cells. No indications.
	2009 (2R20)	VT-1	Hold-downs and attachments to the shroud (2 of 4) 180° apart every other outage. No relevant indications.
	2011 (2R21)	VT-1	Grid/beams: BWRVIP-183. Examined bottom 2" from sides and grid beam intersections of 8 cells. No indications.
	2013 (2R22)	VT-1	Hold-downs and attachments to the shroud (2 of 4) 180° apart every other outage. No relevant indications.
	2015 (2R23)	EVT-1	Grid/beams: BWRVIP-183. Examined bottom 2" from sides and grid beam intersections of 8 cells. No indications.

	2017 (2R24)	VT-1	Relevant Indication - Performed examinations of the Top Guide Hold Down Bracket and Attachment Welds to the Shroud at 86° and 266°. A new indication was found at the 86° azimuth and was evaluated as acceptable for continued operation. The indication will be reinspected during 2R25 to reassess the growth rate.
Core Plate	1994 1995	VT-3	Surfaces: Examined accessible areas during CRB replacement. No indications. Hold down bolts: No indications. No BWRVIP inspections are required. Core Plate wedges installed in 1995.
Standby Liquid Control	1980-96	VT-2	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.
	2000 2001 2003	Direct VT-2	Safe-end & Extension : 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.
	2005	UT	Safe-end & Extension per ASME Supplement 10. No indications.
	2015 (2R23)	UT	N10 Safe-end & Extension exam per ASME Supplement 10. No indications.
Jet Pump Assembly	1980-1998	UT	Hold down beams: UT each outage in '80 - '88 outages - indications in 1 beam, replaced with original design. Replaced all beams in '89 with improved design.
	1994	VT-1/3	1994: Riser Brace Pads & Arms, Restrainers. No Indications
	1995	VT-1/3	1995: All adjusting screw tack welds, sensing lines & support brackets, pads & arms. No Indications. 4 assemblies: (riser brace pad, restrainer

			adjusting screw tack welds, riser brace arm tack welds, inlet mixer, sensing line, restrainer set screw gaps). No indications.
	1997	VT-1 (.001) & VT-3	Hold down beams: All 20 Hold down beams examined in '98 per BWRVIP-41. No indications. Thermal Sleeve to Elbow Welds: All 10. No indications.
	1998	MVT-1	All High Priority Welds (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.
	2000	EVT-1	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.
	2001	VT-1 & EVT-1	50% of the medium priority welds per BWRVIP-41. RS-6 to RS-7's, RS-8 to RS-9's, RB-1's, RB-2's, MX-1's, WD-1's, DF-1's. No relevant indications.
	2003	EVT-1	Thermal Sleeve to Elbow Welds (RS-1): 50% of the population. No indications
	2005 (2R18)	EVT-1	Performed 50% of the RS-2, RS-3, DF-2, AD-1, AD-2, RB-1a(b)(c)(d) & RB-2a(b)(c)(d). No indications.
	2007 (2R19)	VT-1 EVT-1 UT	Performed VT-1 100% of the WD-1's. Performed 100% UT of BB-1, BB2, & BB-3. Performed EVT-1 50% of RS-8 to RS-9's, IN-4's, MX-2's, DF-1's, RS-6,s & RS-7's. No indications.
	2009 (2R20)	EVT-1, VT-1	Performed 2nd 50% reinspection of RS-1, RS-2, RS-3, DF-2, AD-1 & AD-2. Inspected (2) RB-1 locations. No indications.

	2011 (2R21)	EVT-1, VT-1	Performed VT-1 of 100% of the WD-1 population. Performed EVT-1 of 100% of RS-8 to RS-9 welds. Performed EVT-1 of 4 total RB-1 weld locations and 3 total RB-2 weld locations. Performed VT-1 of 2 jet pump sensing line brackets. No relevant indications.
	2013 (2R22)	EVT-1, VT-1	Performed EVT-1 re-inspection of 25% of IN-4's, MX-2's, DF-1's, RS-6's & RS-7's. No indications.
	2015 (2R23)	EVT-1, VT-1	Performed EVT-1 re-inspection of 50% of RS-1, RS-2, RS-3, DF-2, AD-1 and AD-2 welds, as well as 25% of RB-1 welds. Performed VT-1 of 100% of WD-1 population. No indications. Also performed VT-1 of 100% of AS-1 population, with minor set screw gaps noted at 6 Jet Pumps evaluated as acceptable.
	2017 (2R24)	VT-1	No Relevant Indications - Performed re-inspections (VT-1) of five (5) Jet Pump WD-1 Locations (25%) and two (2) Jet Pump Sensing Line Brackets.
		EVT-1	Additionally, performed re-inspections (EVT-1) of 25% of the RS-8/9 Welds and the RB-2a, RB-2b, RB-2c, & RB-2d Welds.
		UT	Finally, performed re-inspections (UT) on 100% of the BB-1, BB-2, and BB-3 Welds.
Guide Tubes	1994	VT-3	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.
	2001	EVT-1 & VT-1	Guide Tube Welds: 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
Instrument Penetrations	1980-2005 2006 and forward	VT-2 VT-2 PT	2N11, 2N12, 2N16 Nozzles. Examined during RPV leakage test each outage. No indications. 2N11 and 2N12 are Hatch ASME exempt. VT-2 performed during leakage test each outage. No indications. 2N16 requires 100% surface exam per interval. 2N16B inspected 2011. 2N16A inspected 2015. No indications to date.
*RPV Interior Attachments (BWRVIP-48) *Other Attachments examined by other BWRVIP documents.	1989 1992 2001	VT-1, VT-3 VT-1, VT-3 EVT-1 VT-1	Feedwater sparger brackets: NUREG-0619, Examine every fourth outage. Examined in '89, '92 & '97. Mechanical damage on 1 bracket in '83 – bracket replaced. No new indications. Guide rod brackets: Examine once/interval. Examined in '92. Mechanical damage on 1 bracket in '92 – safe for continued operation. Steam dryer hold down brackets: Examine once/interval. Examined in '92. No indications. Steam dryer support brackets: Examine once/interval. Examined in '92, '94 & '97. Raised metal indications on 2 brackets in '92 – metal removed, safe for continued operation. Surveillance specimen brackets: Examine once/interval. Examined in '92, '97 & '98. No indications. BWRVIP-48 in '98. Feedwater sparger brackets: 50% of the brackets. No relevant indications. Once/10 years. Surveillance specimen brackets: 1 of 3 brackets. No relevant indications. Once/10 years.

	2003	EVT-1	Steam Dryer Support Brackets: Scheduled 2 of 4. 1 had piece missing near corner. Expanded scope to all 4 and found another to be cracked on corner. Cracking was determined to be caused by fatigue. Cracked piece was removed. Future corrective action to be determined. Re-examine next outage.
	2005	EVT-1	Steam Dryer Support Brackets: Found another with a piece missing on a corner. Modifications were made by flat toping all 4 brackets by EDM. All 4 Steam Dryer seating surfaces were also flattened by EDM. To examine next outage. Feedwater sparger brackets: examined 2 of 4. No indications
	2007	VT-3	All Guide Rod Brackets: VT-3. 30° Upper Surveillance Specimen Brackets: VT-3. 30°Lower Surveillance Specimen Brackets: EVT-1. All Steam Dryer Support Brackets EVT-1. No Indications.
	2009 (2R20)	EVT-1 VT-1 VT-3	Inspected (2) RB-1 locations, (2) PB locations , and upper & lower surveillance specimen at 300° location. No indications.
	2011 (2R21)	VT-3 EVT-1 VT-3	Inspected 1 of 3 surveillance specimen brackets at 120° location, and 4 Jet Pump Riser Brace (RB-1) locations. No relevant indications.
	2013 (2R22)	EVT-1/ VT-3	Steam dryer hold down brackets: Inspected all 4 locations. No indications. Steam dryer support brackets: Inspected 2 locations. Repairs made 2R18 (2005). No changes noted.
	2015 (2R23)	EVT-1, VT-3	Core spray bracket and attachment welds to RPV at 330° location. No indications.
	2017 (2R24)	EVT-1, VT-3	Relevant Indications - Performed an examination of: (1) the RPV Clad

			Anomaly at 300° and (2) Steam Dryer Support Lug Attachment Weld to RPV at 326° and found no changes in the previously identified indications. No Relevant Indications - Performed examinations of the: Upper Guide Rod Bracket Attachment Weld to the RPV (0° & 180°), Guide Rod and Lower Guide Rod Bracket Attachment Weld to the RPV (0° & 180°), Upper and Lower Surveillance Specimen Bracket Attachment Weld to the RPV (30°), Steam Dryer Support Lug Attachment Weld to the RPV (34° & 326°), and the Core Spray Piping Bracket to the RPV (30° & 210°). Minor service related indications were found at the Upper Guide Rod and were evaluated as acceptable for continued operation. Additionally, the Surveillance Specimen at 120° was removed.
LPCI Coupling (BWRVIP-42)	N/A	N/A	Not Applicable to Hatch
Steam Dryer (BWRVIP-139)	2007	VT-1	<u>BWRVIP-139</u> 2 – Steam Dryer Cover Plate Horizontal Welds at 0° & 180° – No indications 2 – Steam Dryer Upper Hood Horizontal Welds – No indications 2 – Steam Dryer Radial Cover plate Welds at 90° & 270° – No indications 8 – Steam Dryer Drain Channel Welds – No indications 1 – Steam Dryer Manway Cover Weld at 270 degrees – No indications 49 – Steam Dryer Vertical End Plate & Partition Welds – No indications 28 – Steam Dryer Tie Bars & Welds – No indications 1 – Steam dryer Upper Support Ring 0-360° (Top & Vert Surfaces) Minor indications on upper support ring side are monitored for change. 4 – Steam Dryer lifting eye and attachment

			welds <u>Asset Management</u> 4 – Steam Dryer Seismic Brackets – Minor indications on upper support ring side are monitored for change. 2 – Steam Dryer Lower Support Ring (24" either side of guides at 0° & 180°) – No indications 1 – Steam dryer Upper Guide at 180° – No indications
	2009 (2R20)	VT-1 (89)	Inspected all four steam dryer seismic brackets and upper support ring top and vertical surfaces 0-360° – Minor indications on upper support ring side were being tracked for changes. No discernible changes.
	2011 (2R21)	VT-1 (89)	Inspected steam dryer upper support ring top and vertical surfaces (0-360°). Minor indications on upper support ring side were being tracked for changes. No discernible changes.
	2013 (2R22)	VT-1 (89)	Inspected 4 Steam Dryer lifting eye, rod, & attachment welds, 2 steam dryer seismic brackets & attachment welds to support ring, 1 manway cover weld and 3 other horizontal hood welds, the lower support ring and upper and lower guides at 0 deg, 9 vertical partition welds, 12 vertical hood welds, 4 drain channels, and 14 tie bars. Damage due to steam dryer removal or installation at 0 deg Upper Guide was evaluated acceptable as-is. No other reportable indications.
	2015 (2R23)	VT-1 (89)	Inspected steam dryer upper and lower guides at 180°. No indications. Also reinspected steam dyer seismic brackets at 214° and 146°. No changes to existing indications. Minor changes to wear pattern on contact surfaces of at both locations. Evaluated as acceptable.

	2017 (2R24)	VT-1 (89)	Relevant Indications - Performed examinations on the Upper Support Ring Vertical and Top Surfaces (from 0°-360°). There were no changes to existing indications. No Relevant Indications - Performed examinations on the Steam Dryer: Lifting Eyes (two (2)), Rod and Attachment Welds (two (2) each), Tie Bar and Attachment Welds (14 each), Vertical Hood Welds (ten (10)), Vertical Hood Support Welds (eight (8)), Vertical Partition Welds (seven (7)), Drain Channel Welds (one (1) - DC-8), Horizontal Welds (three (3)), and the Lower Support Ring (180°).
Moisture Separator	2009 (2R20)	VT-1 (89)	Lifting eye, rod brackets and attachment weld at all four locations. Guide rod brackets at both locations. Lower support ring gussets 0-360° (18 locations). No indications.
	2011 (2R21)	VT-1 (89)	Inspected moisture separator guide rod removable guide pins at 0° and 180° locations. Non-relevant indications noted on guide pins as well as gouge indications on brackets. No discernable change in wear from previous outage. To be reinspected in 6 years.
	2017 (2R24)	VT-1 (89)	Relevant Indication - Re-inspected Moisture Separator Guide Rod Bracket and Moveable Guide Pins at the 0° and 180° locations. New indications were noted on the Guide Rod Pins to Mid Support Ring and Upper Support Ring, but were evaluated for continued operation. There were no discernable changes (i.e. wear) to indications noted during previous examinations.
DM Welds	2009 (2R20)	UT	18 DM weld examinations using automated Appendix VIII qualified UT.

			3 SM alloy 182 weld examinations using automated Appendix VIII qualified UT. 3 examinations using manual Appendix VIII qualified UT. One axial flaw was identified in the "2G" recirculation riser nozzle-to-safe end weld. The flaw was characterized as ID connected in the weld butter on the safe end side and 0.26" (out of 1.22" thickness) deep. Analyzed as acceptable for one cycle of operation.
	2011 (2R21)	Repair	Weld Overlay performed successfully on N2G nozzle to safe end weld.
	2015 (2R23)	UT	10 DM weld and overlay examinations using automated and manual Appendix VIII qualified UT (1 manual, 6 automated and 3 combinations of both). No reportable indications
		Repair	Weld Overlay performed successfully on N4A nozzle safe end extension to transition piece.

Reactor Internals Inspection History

Plant: **LaSalle 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	L2R15 (2015)	EVT-1	Welds AP1, AP2, AP3, AP4a, AP4b, AP4c, AP4c-1, AP4d, AP5, AP6, AP7, AP8a, AP8b, BP3, BP4a, BP4b, BP4c, BP4c-1, BP4d, BP5, BP6, BP7, BP8a, BP8b, CP1, CP2, CP3, CP4a, CP4b, CP4c, CP4c-1, CP4d, CP5, CP6, CP7, CP8a, CP8b, DP3, DP4a, DP4b, DP4c, DP4c-1, DP4c-2, DP4d, DP5, DP6, DP7, DP8a, and DP8b. Piping brackets PB-068, PB-095, PB-265, and PB-292. All NRI.
	L2R14 (2013)	EVT-1	Welds AP1, AP2, AP3, AP4a, AP4b, AP4c, AP4c-a, AP4d, AP5, AP6, AP7, AP8a, AP8b, BP3, BP4a, BP4b, BP4c, BP4c-a, BP4d, PB5, BP6, BP7, BP8a, BP8b, CP1, CP2, CP3, CP4a, CP4b, CP4c, CP4c-a, CP4d, CP5, CP6, CP7, CP8a, CP8b, DP3, DP4a, DP4b, DP4c, DP4c-a, DP4c-b, DP4d, DP5, DP6, DP7, DP8a, and DP8b. Piping brackets PB-015, PB-165, PB-195 and PB-353. All NRI.
	L2R13 (2011)	EVT-1	AP1, AP2, AP3, AP4a, AP4b, AP4c AP4d, AP8a, BP3, BP4a, BP4b, BP4c, BP4d, BP8a, CP1, CP2, CP3, CP4a, CP4b, CP4c, CP4d, CP8a, CP8b, DP3, DP4a, DP4b, DP4c, DP4d, DP8a, and DP8b. NRI. Three new longitudinal welds identified located adjacent to CP4a at 187°. All examined by EVT-1 with NRI.
	L2R12 (2009)	UT	UT of 34 welds; AP1, AP2, AP3, AP4a, AP4b, AP5, AP6, AP7, AP4c, AP8b, BP3, BP4a, BP4b, BP5, BP6, BP7, BP4c, BP8b, CP1, CP2, CP3, CP4a, CP4b, CP5, CP6, CP7, CP4c, DP3, DP4a, DP4b, DP5, DP6, DP7 and DP4c. Existing flaw on

			BP5 determined to be geometry. All others NRI. Four new welds identified, (AP4c-1, BP4c-1, CP4c-1, and DP4c-1) located between P4c and P7 (OE28372). All examined by UT with NRI.
		EVT-1	AP1, AP2, AP3, AP4a, AP4b, AP4c, AP4c-1, AP4d, AP8a, AP8b, BP3, BP4a, BP4b, BP4c, BP4c-1, BP4d, BP5, BP8a, BP8b, CP1, CP2, CP3, CP4a, CP4b, CP4c, CP4c-1, CP4d, CP8a, CP8b, DP3, DP4a, DP4b, DP4c, DP4c-1, DP4c-2, DP4d, DP5, DP8a, and DP8b. NRI. Five new welds identified, (AP4c-1, BP4c-1, CP4c-1, DP4c-1 and DP4c-2) located between P4c and P7. All examined by EVT-1 with NRI.
	L2R11 (2007)	EVT-1	Visual examinations of core spray piping welds for which the UT is not demonstrated. No indications (NRI). 8 piping brackets; NRI.
	L2R10 (2005)	UT	UT of 34 welds; AP1, AP2, AP3, AP4a, AP4b, AP5, AP6, AP7, AP4c, AP8b, BP3, BP4a, BP4b, BP5, BP6, BP7, BP4c, BP8b, CP1, CP2, CP3, CP4a, CP4b, CP5, CP6, CP7, CP4c, DP3, DP4a, DP4b, DP5, DP6, DP7 and DP4c. Existing flaw on BP5 re-sized with no growth. All others NRI.
		EVT-1	Welds for which UT is not demonstrated: AP1, AP4d, AP8a, BP5, BP4d, BP8a, CP1, CP4d, CP8a, CP8b, DP4d, DP8a, and DP8b. NRI. 2 core spray piping brackets; NRI.
	L2R09 (2003)	EVT-1	Visual examinations of those core spray piping welds for which the UT technique is not demonstrated. No indications.
	L2R08 (2000)	UT	UT for those welds for which the UT tool is qualified.

		EVT-1	8 piping brackets; NRI.
Core Spray Sparger	L2R15 (2015)	EVT-1	S1A, S2A (left and right), S4A (left and right), S1B, S2B (left and right), S4B (left and right), S1C, S2C (left and right), S4C (left and right), S1D, S2D (left and right), S4D (left and right). All NRI.
		VT-1	S3A-a, S3A-b and S3A-c from 007 to 088°. S3D-a and S3D-b from 352 to 088°. Bent sparger nozzle deflector identified in L2R11 unchanged, all others NRI. 6 sparger brackets; NRI.
	L2R14 (2013)	VT-1	6 sparger brackets; NRI. S3A-a, S3A-b, and S3A-c from 272 to 007°. S3C-a, S3C-b, and S3C-c from 092 to 187°. S3D-a and S3D-b from 272 to 352°. All NRI.
	L2R13 (2011)	VT-1	6 sparger brackets; NRI. S3B-a, S3B-b and S3B-c from 172.5 to 268°, S3C-a and S3C-b from 187 to 268°; bent sparger nozzle deflector identified in L2R11 unchanged. All others NRI.
		EVT-1	S1A, S2A (Left and right), S4A, S1B, S2B (Left and right), S4B, S1C, S2C (Left and right), S4C, S1D, S2D (Left and right), S4D. NRI.
	L2R12 (2009)	VT-1	6 sparger brackets; NRI. S3A-a, S3A-b and S3A-c from 268 to 7.5°, S3A-a, S3A-b and S3A-c from 7.5 to 88°, S3B-a, S3B-b, and S3B-c from 172.5 to 268° and S3B-a, S3B-b, and S3B-c from 88 to 172.5°; bent sparger nozzle deflector identified in L2R11 unchanged. All others NRI.
	L2R11 (2007)	VT-1	S3D-a, S3D-b and S3D-c from 352 to 88° and S3C-a, S3C-b and S3C-c from 7.5 to 88°; one bent sparger nozzle deflector; all others NRI. Bent nozzle accepted for one

			cycle. 6 sparger brackets; NRI.
		EVT-1	S1A, S2A (Left and right), S4A, S1B, S2B (Left and right), S4B, S1C, S2C (Left and right), S4C, S1D, S2D (Left and right), S4D. NRI.
	L2R10 (2005)	VT-1	S3A-a and S3A-d from 268 to 008° and S3D-a and S3D-b from 352 to 268; NRI 6 sparger brackets; NRI.
	L2R09 (2003)	EVT-1	Visual inspection of half of the core spray sparger welds. NRI. 6 sparger brackets; NRI.
	L2R08 (2000)	VT-1	100% of all sparger welds. NRI.
		EVT-1	12 sparger brackets. NRI.
Attachment Welds	L2R16 (2017)	VT-3	2 Guide Rod vessel attachment welds; NRI. One feedwater sparger bracket pin, no change to previously identified minor wear. All four steam dryer hold-down lugs; NRI.
	L2R15 (2015)	VT-1	Lower surveillance capsule at 030°, NRI.
		VT-3	Upper surveillance capsule at 030°, NRI.
		EVT-1	Twelve feedwater sparger bracket to vessel welds; NRI.
		VT-3/ VT-1	Eight feedwater sparger bracket pins; minor wear at pin/bracket interface at six locations. Accepted as-is.
	L2R14 (2013)	VT-1	Surveillance capsule holder lower bracket; NRI.
		VT-3	Surveillance capsule holder upper bracket; NRI.
		EVT-1	Four steam dryer support lug attachment welds. NRI. Four feedwater sparger bracket to vessel welds; NRI. Minor wear at pin/bracket interface on three of the

			spargers.
	L2R13 (2011)	VT-1	Lower surveillance capsule bracket at 120°; NRI.
		VT-3	Upper surveillance capsule bracket at 120°; NRI.
	L2R11 (2007)	N/A	(See jet pump and core spray sections of this report.)
	L2R10 (2005)	EVT-1	Steam dryer attachment welds, four locations, NRI.
		VT-3	Upper bracket attachment welds for surveillance baskets at three locations, NRI.
		VT-1	Lower bracket attachment welds for surveillance baskets at three locations. Basket disengaged at 120° location and accepted for one cycle. All others NRI.
		EVT-1	All feedwater sparger attachment welds; NRI.
	L2R09 (2003)	EVT-1	All feedwater sparger attachment welds; NRI.
	L2R08 (2000)	VT-1	Steam dryer attachment welds, four locations, NRI.
		VT-3	Guide Rod attachments at 0° and 180; NRI. Upper surveillance capsule brackets at three locations: NRI.
		VT-1	Lower surveillance capsule brackets at three locations; NRI.
Core Shroud (Note: LaSalle has two beltline horizontal welds and thereby unique designation).	L2R16 (2017)	EVT-1	Visual inspection of H4 for off-axis cracking in response to EPRI Letter 2016-030; NRI.
	L2R15 (2015)	UT	UT of welds H1, H2, H3, H4, H5, H6, H7, and H8. Flaws identified on H1, H3, and H4. Accepted as-is with 10 year EOI.

		EVT-1	Visual inspection (from shroud ID and OD) of vertical welds V12, V13, V14, and V15. NRI. Visual inspection (from shroud OD) of horizontal welds H1 and H2; NRI.
	L2R11 (2007)	VT-3	Surfaces of the shroud for ASME Section XI. NRI.
	L2R10 (2005)	UT	UT of welds H3, H5, H6, and H8 All welds are NRI.
	L2R07 (1996)	UT	UT of H5, H6, and H8. NRI.
	L2R06 (1995)	UT	UT of H3, H4, H5, H6, and H8. NRI.
Shroud Support	L2R16 (2017)	EVT-1	Top of H8a weld at the 0° and 180° locations. NRI.
	L2R15 (2015)	EVT-1	Access hole cover at 0°; NRI.
	L2R14 (2013)	EVT-1	Top of H9 weld at the 0° and 180° locations - NRI. Access hole cover at 180° - NRI.
	L2R13 (2011)	EVT-1	H8a weld (BWRVIP weld H8) for >10%--NRI.
	L2R12 (2009)	EVT-1	Access Hole Covers at 0 and 180°--NRI
	L2R11 (2007)	VT-3	Access Hole Covers at 0 and 180° for ASME Section XI. NRI Accessible portions of the top of the shroud support plate for ASME Section XI. NRI. Top of H9 weld (accessible locations) for ASME Section XI. NRI
	L2R10 (2005)	VT-1	Access Hole Covers at 0 and 180°--NRI

		VT-3	Inspection of the general condition of the RPV interior surface from the RPV closure flange elevation to the Steam Dam, 360° around the RPV interior. NRI. Inspection of the general condition of the cladding at the steam dam elevation, 360° around the RPV interior. NRI. Examined RPV cladding from below core plate to shroud support plate due to removal of the inlet mixers. NRI.
		EVT-1	H8a weld (BWRVIP weld H8) for >10%--NRI
		VT-3	Inspection of the general condition of weld H9 from below the shroud support plate due to removal of all jet pump inlet mixers. NRI.
	L2R09 (2003)	UT	UT of 100% of H9 from the RPV OD. NRI.
		VT-3	Inspection of the general condition of the RPV interior surface from the RPV closure flange elevation to the Steam Dam, 360° around the RPV interior. NRI. Inspection of the general condition of the cladding at the steam dam elevation, 360° around the RPV interior. NRI.
Top Guide	L2R16 (2017)	VT-3	C-clamp at 0° - NRI.
	L2R14 (2013)	VT-3	C-clamp at 270°. NRI.
	L2R13 (2011)	VT-3	C-clamp at 090 and 180° locations—NRI
		EVT-1	Lower Beam and Slot Intersections of 19 cells—NRI.
	L2R11 (2007)	VT-3	C-clamp at 0°. NRI Accessible portions of the top guide for ASME Section XI. NRI

	L2R10 (2005)	VT-3	C-clamps at 4 locations—NRI
SLC	L2R16 (2017)	UT	UT of the partial penetration weld and HAZ. NRI.
	L2R15 (2015)	VT-2	Visual inspection of the partial penetration weld to the bottom head during the Section XI system leak test. NRI.
	L2R14 (2013)	VT-2	Visual inspection of the partial penetration weld to the bottom head during the Section XI system leak test. NRI.
	L2R13 (2011)	VT-2	Visual inspection of the partial penetration weld to the bottom head during the Section XI system leak test. NRI.
	L2R12 (2009)	VT-2	Visual inspection of the partial penetration weld to the bottom head during the Section XI system leak test. NRI.
	L2R11 (2007)	VT-2	Visual inspection of the partial penetration weld to the bottom head during the Section XI system leak test. NRI.
		UT	UT of the partial penetration weld and heat affected zone. NRI.
	L2R10 (2005)	VT-2	Visual inspection of the partial penetration weld to the bottom head during the Section XI system leak test. NRI.
	L2R09 (2003)	VT-2	Visual inspection of the partial penetration weld to the bottom head during the Section XI system leak test. NRI.
		PT	Surface examination. NRI.
	L2R08 (2000)	VT-2	Visual inspection of the partial penetration weld to the bottom head during the Section XI system leak test. NRI.
Jet Pump Assembly	L2R16 (2017)	VT-1	Main wedge WD-1 on all 20 pumps. Minor new wear on JP 3 prompted

			inspection of Jet Pump 3 AS-1, AS-2, and WD-2 locations. Gaps seen at AS-1 were closed by adjusting main wedge. Indication on one of two VS AS-2 tack welds accepted for one cycle. Four auxiliary wedges; no change in existing wear on JP 15 VS, all others NRI.
	L2R15 (2015)	VT-1	Main wedge WD-1 on all 20 pumps; minor new rod wear on 2 pumps. Accepted as-is, all others were either NRI or wear was unchanged from previous exam. Auxiliary wedge on Vessel Side of JP 15; no change in existing wear.
	L2R14 (2013)	VT-1	Sensing line brackets on eight pumps; NRI. Main wedge WD-1 on all 20 pumps; minor new rod wear on 3 pumps; all others were either NRI or wear was unchanged from the last exam. Auxiliary wedge on Vessel Side of JP-15; no change in existing wear.
		VT-3	Visual of the slip joint area on all 20 pumps in response to GEH SC 12-12 and 12-14. NRI.
	L2R13 (2011)	VT-1	WD-1 on all 20 pumps; three wedges showed movement with no change in wear from previous examinations; five rods showed new wear; accepted as-is. Four auxiliary wedges examined, two vessel side and two shroud side. One vessel side auxiliary wedge had new minor wear at the contact point with the belly band and movement; accepted-as-is. Other auxiliary wedges were NRI.
	L2R12 (2009)	VT-1	WD-1 on 9 pumps; all showed minor wear with most unchanged from previous examinations. Three auxiliary wedges examined, two vessel side and one shroud side. One vessel side auxiliary wedge had minor

			wear. Set screw on same pump confirmed to be in contact with the belly band and tack welds intact. Other auxiliary wedges were NRI.
	L2R11 (2007)	VT-1	WD-1 wedges on all 20 pumps; 7 wedges/rods showed minor wear; accepted-as-is. Auxiliary wedges installed at four locations on 3 pumps to compensate for observed gaps.
		VT-3	Examination of ratchet teeth engagement on 13 jet pump hold down beams due to fit-up issues in the previous outage. NRI
	L2R10 (2005)	VT-1	All 20 inlet mixers were replaced with new inlet mixers with labyrinth seals in the slip joint area, and with new non-stellite main wedges. New hold down beams were installed on 17 pumps. After replacement, three point contact verified at all locations (AS-1 shroud side, AS-1 vessel side, and WD-1). NRI.
	L2R09 (2003)	N/A	Replacement of 3 beams. After a review of material certification paperwork that identified them as Group 1 beams, three holddown beams were replaced with low stress beams.
		VT-1	WD-1 on 3 pumps; NRI. Installed 3 aux. Wedges to ensure three point contact for three pumps.
	L2R08 (2000)	UT	UT exam of 10 beams at the BB-1 and BB-2 locations. NRI.
		VT-3	Exam of WD-1 on all 20 pumps; NRI. Exam of all set screw to belly band contact points; installed 7 auxiliary wedges to maintain three point contact; all others NRI.
Jet Pump Diffuser	L2R16 (2017)	EVT-1	AD-2 on 5 pumps; NRI. DF-1 on 5 pumps; NRI. DF-2 on 5 pumps; NRI.

			DF-3 on 5 pumps; NRI. IN-1 on 5 pumps; NRI. IN-2 on 5 pumps; NRI.
	L2R15 (2015)	EVT-1	AD-2 on 5 pumps; NRI. DF-1 on 5 pumps; NRI. DF-2 on 5 pumps; NRI. DF-3 on 5 pumps; NRI.
	L2R13 (2011)	EVT-1	IN-1 on 5 pumps; NRI. IN-2 on 5 pumps; NRI.
	L2R11 (2007)	EVT-1	AD-2 on 6 pumps; NRI. DF-1 on 10 pumps; NRI.
	L2R10 (2005)	EVT-1	AD-2 on 4 pumps; NRI. DC-3 on 10 pumps; NRI. DF-2 on 10 pumps; NRI. DF-3 on 10 pumps; NRI.
	L2R09 (2003)	EVT-1	AD-2 on 4 pumps; NRI. DF-1 on 4 pumps; NRI. DF-2 on 4 pumps; NRI. DF-3 on 4 pumps; NRI. IN-1 on 10 pumps; NRI. IN-2 on 10 pumps; NRI.
	L2R08 (2000)	EVT-1	AD-2 on 6 pumps; NRI. DF-1 on 6 pumps; NRI. DF-2 on 6 pumps; NRI.
		UT	DF-3 on 6 pumps; NRI.
Jet Pump Riser	L2R16 (2017)	EVT-1	RS-2 on 3 risers; NRI. RS-3 on 5 risers; NRI. RS-6 on 2 risers; NRI. RS-7 on 3 risers; NRI. RS-8 on 3 risers; NRI. Corners of RS-9 on all 10 risers; NRI. RB-1 on 5 jet pumps; NRI. RB-2 on 5 jet pumps; NRI. All RS-1 welds (including pup piece welds) on 4 risers. Re-sized flaw on RS-1c on 19/20 with no change in length, accepted for four cycles. All others NRI. Strain relief welds on four risers; NRI.

	L2R15 (2015)	EVT-1	Corners of RS-9 on all 10 risers; NRI. RS-6 on 1 riser; NRI. RS-7 on 1 riser; NRI.
	L2R14 (2013)	EVT-1	RS-9 on 9 risers; NRI. RS-1a on 19/20; NRI. Re-sized flaw on RS-1c on 19/20; no change in length.
	L2R13 (2011)	EVT-1	All RS-1 welds (including pup piece welds) on 2 risers; NRI. RS-2 on 3 risers; NRI. RS-3 on 5 risers; NRI. RS-6 on 2 risers; NRI. RS-7 on 1 riser; NRI. RS-8 on all 10 risers; NRI. RS-9 on all 10 risers; NRI. RB-1 on 5 jet pumps; NRI. RB-2 on 5 jet pumps; NRI. Strain relief welds on four risers; NRI.
	L2R12 (2009)	EVT-1	All RS-1 welds (including pup piece welds) on 8 risers; Re-sized flaw on RS-1c on 19/20; no change in length. All others NRI.
	L2R11 (2007)	EVT-1	Re-sized flaw on RS-1c on 19/20; no change in length. RS-1 on 2 risers; NRI. RB-1 on 12 jet pumps; NRI.
	L2R10 (2005)	EVT-1	Examined strain relief welds on all 10 risers. NRI Re-sized flaw on RS-1c on 19/20; no change in length. RS-2 on 3 risers; NRI. RS-3 on 5 risers; NRI. RS-6/7 on 10 jet pumps; NRI. RS-8/9 on all 20 jet pumps; NRI. RB-1 on 10 jet pumps; NRI. RB-2 on all 20 jet pumps; NRI.
	L2R09 (2003)	EVT-1	Re-examined flaws on two RS-1 welds; that on the 1/2 riser was determined to be non-relevant; those on the 19/20 riser were re-sized, with no change since

			L2R07 (1996). MX-2 on 4 pumps; NRI. RS-6/7 on ten pumps; NRI.
	L2R08 (2000)	UT	UT exam of MX-2 on 6 pumps; NRI.
	L2R07 (1996)	VT-1	RS-1 on all ten risers; two indications; one on the 1/2 riser and the second on the 19/20 riser; both accepted for two cycles. RS-2 on all ten risers. NRI. RS-3 on all ten risers. NRI.
Steam Dryer	L2R16 (2017)	VT-1	Ten tie bars; NRI. One tie rod; no change in existing indication. One access hole cover at 270°. Two vertical welds on the 90° side and ten vertical welds on the 270° side; NRI. Lifting Lug Bracket welds at 45°, NRI.
	L2R15 (2015)	VT-1	Fifteen tie bars; NRI. Two tie rods; NRI for TR-01-090, no change in existing indications on TR-21-090. One drain channel vertical weld at 240°, eleven vertical welds on the 270° side, seven vertical welds on the 90° side, four horizontal welds on the 270° side. All NRI.
	L2R14 (2013)	VT-1	Two access hole covers associated with the seismic blocks at 5° and 185°; NRI. Re-examined the tie bars TB-05 and TB-28; no change in existing indications. Re-examined tie rod TR-21-090; no change in existing indications.
	L2R13 (2011)	VT-1	One vertical weld on the 270° side; NRI. One horizontal weld on the 90°side; NRI Upper and lower guide bracket at 180° and lower guide bracket at 0°. Previous indications showed no change. Two tie bars. Previous indications on tie bars reviewed and unchanged. Four tie rods; one previous indication re-confirmed with no change. All others

			NRI. Upper support ring from 0-360°; previous indication re-confirmed with no change.
	L2R12 (2009)	VT-1	11 vertical welds on the 90° side, all NRI. 6 horizontal welds; all NRI. Upper and lower guide bracket at 180° and lower guide bracket at 0°. All RI as was the top of the guide rod at 180°. Conditions accepted as-is. Upper guide bracket at 0°; NRI. 15 tie bars. Previous indications on tie bars reviewed and unchanged. All others NRI. Two tie rods; one previous indication re-confirmed with no change. Second tie rod was NRI. Upper support ring from 0-360°; top and side RI; bottom NRI. All indications accepted as-is.
	L2R11 (2007)	EVT-1	All welds recommended by BWRVIP-139 and SIL 644 Revision 2 for a curved hood dryer on the 90° side of the dryer, tie rods on both sides, upper support ring external surfaces, upper and lower guide at 180°, (indication on the lower guide bracket accepted for one cycle), lifting lugs and lifting assembly brackets at 45 and 135°, and 18 tie bars. Previous indications on tie bars reviewed and no change in sizes. All other welds NRI.
	L2R10 (2005)	VT-1	All welds recommended by SIL 644 Revision 1 for a curved hood dryer on the 270° side of the dryer, horizontal bank welds on both the 90° and 270° sides, all four lifting lugs; lifting assembly brackets at 225° and 315° locations, and all tie bars. Indications found on three tie bars and accepted for one cycle. Upper strap on lifting assembly at 215° found broken and was removed. All other welds NRI.
Vessel	L2R10 (2005)	VT-3	Inspection of the general condition of the RPV interior surface from the RPV closure flange elevation to the Steam

			Dam, 360° around the RPV interior. NRI.
	L2R09 (2003)	VT-3	Inspection of the general condition of the cladding at the Steam Dam elevation, 360° around the RPV interior. NRI.
LPCI	L2R15 (2015)	EVT-1	Examined welds 45-12 and 45-3b at the 045° coupling; NRI.
		VT-1	Examined weld 45-8a,b,c,d at the 045° coupling; NRI.
		VT-3	Examined bolts 45-6a,b,c,d at the 045° coupling; NRI.
	L2R14 (2013)	EVT-1	Examined welds 45-12 at the 315° coupling. NRI.
	L2R13 (2011)	EVT-1	Examined welds 45-12 and 45-3b at 135°; NRI.
		VT-1	Examined weld 45-8a,b,c,d at 135°. NRI.
		VT-3	Examined bolts 45-6a,b,c,d at 135°; NRI.
	L2R11 (2007)	EVT-1	Examined welds 45-12a, b, c, d and 45-03a-d coupling at 315°; NRI.
		VT-1	Examined weld 45-08a,b,c,d at 315°. NRI.
		VT-3	Examined bolts 45-06a,b,c,d coupling at 315°; NRI.
	L2R10 (2005)	EVT-1	Examined welds 45-12a, b, c, d and 45-03a, b, c, d at 45, 135, and 315°; NRI.
		VT-1	Examined weld 45-08a,b,c,d at 45, 135, and 315°. NRI.
		VT-3	Examined bolts 45-06a,b,c,d at 45, 135, and 315°; NRI.
	L2R08 (2000)	EVT-1	BWRVIP-42, visual examination of all three LPCI couplings. No indications detected.

	L2R07 (1996)	VT-3	(Every other outage) VT-3 of all three couplings; NRI.
Lower Plenum	L2R16 (2017)	VT-3	Best-effort examination of all areas below the core plate made accessible by removal of two guide tubes for access to bottom head drain. Areas examined included bottom head drain, four ICH RPV-1, four ICHGT ICH-1, four ICHS-ICGT-1, four ICHS-1 welds, ten CRDH ST, ten CRDH-1, and ten ST RPV-1 welds. All NRI.
	L2R14 (2013)	VT-1	Examined all areas below the core plate made accessible by FME inspection of bottom head area and inside of bottom head drain line. Areas examined included four ICH RPV-1 welds, four ICHGT ICH-1 welds, four ICHS ICGT-1 welds, four ICHS-1 welds, eight CRDH ST welds, eight CRDH-1 welds, and eight RPV-1 welds. All NRI.
	L2R10 (2005)	VT-1	Examined all areas below the core plate made accessible by disassembly of 20 jet pumps. Areas examined included CRD/ST-1, ST/RPV-1, H8a, H9, H10, H11, H12, ICH/RPV-1, and bottom head cladding. NRI for all twenty locations.
	L2R09 (2003)	VT-3 / EVT-1	Visual examination of the fuel support guide tube pins (FS/GT-ARPIN-1) at 4 locations, CRGT-1 at 4 locations, CRGT-2 at 21 locations, and CRGT-3 at 21 locations. No indications.
	L2R08 (2000)	VT-3	Visual examination of the fuel support guide tube pins (FS/GT-ARPIN-1) at 14 locations, CRGT-1 at 15 locations. No indications.
DM Welds—BWRVIP-75-A Category B	L2R16 (2017)	UT	One weld examined by automated UT; no unacceptable flaws detected.
	L2R15 (2015	UT	Five welds examined by automated UT; no unacceptable flaws detected.
	L2R13 (2011)	UT	Eight welds examined by manual UT; no flaws.

DM Welds BWRVIP-75-A Category C	L2R16 (2017)	UT	One weld examined by automated UT; no unacceptable flaws detected.
DM Welds— BWRVIP-75-A Category D	L2R13 (2011) L2R12 (2009)	UT	Two welds examined by manual UT; no flaws. Two previous un-identified Category D welds were identified and the spool piece on which the welds were located was replaced with a spool piece with non-IGSCC susceptible welds.
Other	L2R16 (2017)	VT-1 N/A FME Search VT-3	Visual examination of 5 IRM/SRM dry tubes (upper two feet and verification of plunger engagement per SIL 409). RI for 3 plungers not fully engaged, accepted as-is for one cycle. Replacement of four original equipment IRM dry tubes Removed FME from inside the bottom head drain line. Minor particulate noted and vacuumed from bottom head area. Verified engagement of surveillance capsule basket at 030°. Guide Rod Cap at 000°, tack weld indications accepted as-is.
	L2R15 (2015)	VT-3 N/A	Visual examination of 2 SRM dry tubes and 4 IRM dry tubes (upper two feet and verification of plunger engagement per SIL 409 Rev 4). RI for 4 plungers not fully engaged with top guide, accepted as-is for one cycle. Replacement of 1 SRM dry tube, due to detector replacement.
	L2R14 (2013)	VT-3 FME Search VT-1	Verified engagement of surveillance capsule basket at 30° Removed FME from inside the bottom head drain line. Minor particulate noted on bottom head area. Visual examination of the upper two feet

			of four IRM dry tubes and 1 SRM dry tube. All NRI.
	L2R13 (2011)	VT-3	Verified engagement of surveillance capsule basket at 030°.
	L2R11 (2007)	VT-3	Removal of the surveillance capsule basket from 120° due to a broken spring.

Reactor Internals Inspection History

Plant: **Limerick 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	1999 (2R05)	UT	A UT baseline of H3, H4, H5 and H7 was performed. H4 was the only shroud weld examined from two-sides. Indications identified on I.D. of H3, H5, and on O.D. of H3, H4, and H5. No indications identified at H7. Scope expanded to include UT of all remaining circumferential welds (H1, H2, and H6). Indications identified on I.D. of H1, H2, and H6 and on O.D. of H1. Shroud was reclassified as a Category C, un-repaired shroud. Full structural margin was calculated using one cycle of crack growth. Structural analysis was re-performed in 2R06 and again in 2R07. Re-examination was scheduled for H1, H2, H3, H4, and H6 in 2R08 per site-specific evaluations. H5 and H7 are scheduled for re-examination in 2R10.
	2005 (2R08)	UT	UT was performed on H1 and H6 from one-side with approximately 60% coverage. A two-sided UT was performed on H2, H3, and H4 with approximately 60-63% coverage. Approx. 21.5% of the ring-side scans were obtained for H2 and H3 with a new phased array technique.
		EVT-1	Due to equipment problems, vertical welds could not be screened by UT per BWRVIP-76. As a result, all vertical welds were assumed to "screen in", and an EVT-1 was performed on these welds from the shroud OD. Reinspection of the vertical welds, either UT or two-sided EVT-1, is scheduled for 2007(2R09).

	2007 (2R09)	EVT-1	Fuel was removed from areas surrounding the shroud vertical welds, and an EVT-1 examination was performed from the ID and the OD surfaces of the shroud on four vertical welds V15, V16, V17, and V18. No indications were identified. Another analysis of the indications found in 2R08 (2005) on horizontal welds H1, H2, H3, H4, and H6 was performed to demonstrate that structural margins are maintained until 2009 (2R10). The analysis demonstrated acceptable safety factors are maintained and a reinspection by UT is scheduled for 2R10.
	2009 (2R10)	UT	UT was performed on H3, H4, H5 and H7 from two-sides. A one-sided UT was performed on H2 ring-side concurrent with H3 ring-side exam. Coverage and results are as follows: H-2 LKUP – 83.3% - 0.7% flawed H-3 LKDN – 83.3% - 0% flawed H-3 LKUP – 91.0% - 70% flawed H-4 LKDN – 97.7% - 39.9% flawed H-4 LKUP – 98.2% - 35.4% flawed H-5 LKDN – 77.2% - 12.8% flawed H-5 LKUP – 76.6% - 0% flawed H-7 LKDN – 63.2% - 0% flawed H-7 LKUP – 63.5% - 0% flawed A re-analysis of the H1, H2, and H6 welds was performed prior to this refuel outage and the results supported a 10-year reinspection. Therefore, these three welds are scheduled for inspection in 2015 (2R13). The structural analysis performed at the end of 2R10 only supports one-cycle of operation for the H3, H4, and H5 welds. A site-specific analysis is currently in progress to justify additional cycles of operation prior to reinspection. Since the H7 weld had no flaws identified and

			coverage was greater than 50%, the reinspection interval was determined to be 10 years per BWRVIP-76 Table 2-1.
		EVT-1	Due to multiple tooling issues and failures, portions of the H5 and H7 welds were also visually examined via EVT-1 method from the OD surface only. Visual coverage on the H5 welds is 19.5% of the weld length with no recordable indications identified. Visual coverage on the H7 welds is 13.2% of the weld length with no recordable indications identified.
	2011 (2R11)	UT	UT was performed on all 8 vertical welds (V7, V8, V15, V16, V17, V18, V25, and V26). One indication was identified on the ID of V17 and was 1.4 inches in length. Coverage ranged from 77% to 96% due to various configuration interferences. In addition, a structural re-analysis was performed for several horizontal welds. Additional cycles were justified and the next re-examination is as follows: H1 – 2R13, H2 – 2R13, H3 – 2R15, H4 – 2R15, H5 – 2R15, H6 – 2R13, H7 – 2R15, Verts – 2R16
	2015 (2R13)	UT	A two-sided UT was performed on three horizontal welds (H1, H2, and H6). Coverage and results are as follows: H1 LKDN - 47.4% - 0.0% flawed H1 LKUP - 61.1% - 45.8% flawed H2 LKDN - 61.1% - 29.4% flawed H2 LKUP - 63.0% - 0.0% flawed H6 LKDN - 64.2% - 0.0% flawed H6 LKUP - 64.0% - 58.8% flawed The structural analysis performed at the end of 2R13 only supports one-cycle of operation for the H1, H2, and H6 welds. A site-specific analysis is in progress to justify additional cycles of operation prior

			to reinspection which is currently scheduled for 2R14.
Shroud Support/ Access Hole Covers	1991 (2R01)	VT-3	VT-3 examination of accessible portions of H-8 and H-9 welds from annulus. VT-3 examination of both access hole covers and welds. No indications identified.
	1993 (2R02)	VT-3	VT-3 examination of shroud support leg welds at Azimuth 300 deg through disassembled jet pump #18. No indications identified.
	1995 (2R03)	VT-3	VT-3 examination of both access hole covers and welds. No indications identified.
	1999 (2R05)	EVT-1	EVT-1 examination 10% of the weld H-8 & H-9 length; in areas of 0 & 180 deg. access hole covers. No indications identified.
		VT-3	VT-3 examination of both access hole covers and welds. No indications identified.
	2003 (2R07)	UT	UT of 10% of weld H-9 length. No indications identified.
		VT-3	VT-3 examination of both access hole covers and welds. No indications identified.
	2005 (2R08)	EVT-1	EVT-1 examination of 10% of weld H-8 length. No indications identified.
	2007 (2R09)	VT-1	VT-1 examination of both access hole covers and welds. All three welds were examined on the 180 deg. Top Hat. No indications identified.
		Best effort VT-1/ VT-3	Best effort VT-1 / VT-3 of the lower side of H-8 and H-9, and six shroud support legs (3 welds H10, H11, H12 on each leg) were examined via access through the disassembly of Jet Pumps 1, 12, and 17. No indications were identified.

	2011 (2R11)	EVT-1	EVT-1 examination was performed on both the 0 and 180 degree access hole covers. These completed the baseline exam requirements of BWRVIP-180. All three welds were examined on the 180 degree Top Hat configuration. No indications identified. EVT-1 examination was performed on 14% of the H-8 weld. No indications identified.
	2013 (2R12)	UT	UT of 20% of H-9 weld length from RPV OD. No indications were identified.
	2017 (2R14)	EVT-1	EVT-1 examination was performed on both the 0 and 180 deg. access hole covers. This exam included all three welds on the 180 deg. top hat configuration. No indications identified. EVT-1 examination was performed on 23% of the H8 weld from inside the vessel. No indications identified.
Core Spray Piping	1991 (2R01) – 1995 (2R03)	VT-1	Enhanced VT-1 (1 mil resolution) examination performed every refueling outage on piping and welds per IEB 80-13. No indications identified.
	1997 (2R04)	EVT-1	EVT-1 (1/2 mil resolution) examination of welds per IEB 80-13 and BWRVIP-18 baseline. No indications identified.
	1999 (2R05)	UT	UT examination of welds (P1 thru P8) per BWRVIP-18 baseline UT. No indications identified.
		EVT-1	EVT-1 supplemental examination on P4dA, P4dB, P4dC, P4dD, P8aA, P8aB, P8aC, and P8aD. No indications identified.
	2001 (2R06)	EVT-1	EVT-1 of P4dA, P8aA, P8aB, P8aC, and P8aD. No indications identified.

	2003 (2R07)	UT	UT examination of welds (P1 thru P8) with the exception of P4a, P4b, P4d and P8a welds. No indications identified.
		EVT-1	EVT-1 of P4dB, P8aA, P8aB, P8aC, and P8aD. No indications identified.
	2005 (2R08)	EVT-1	EVT-1 of P4dA, P4dC, P8aA, P8aB, P8aC, and P8aD. No indications identified.
	2007 (2R09)	UT	UT examination of P1, P2, P3a, P3b, P4b, P5, P6, P7, and P8b welds was performed. No indications were identified.
		EVT-1	EVT-1 of the far side of P1, P2, P3a, P3b, P4b, and P8b welds, as well as an EVT-1 examination of P4dD and P8a welds was performed. A small piece of raised metal was identified and evaluated as acceptable on the P8aC weld. Also, a small indentation on the collar near the P8aD weld was identified and evaluated as acceptable.
	2009 (2R10)	EVT-1	EVT-1 of the far side of P1, P2, P3a, P3b, P4b, and P8b welds, as well as an EVT-1 examination of P4dA and P8a welds was performed. No indications were identified. Previously identified indications on P8aC and P8aD could not be found in 2R10.
	2011 (2R11)	EVT-1	EVT-1 was performed on both near and far sides of the following locations: P1, P2, P3a, P3b, P4a, P5, P6, P7, P8a, and P8b welds. In addition, EVT-1 was performed on P4dB. No indications identified.
	2013 (2R12)	EVT-1	EVT-1 was performed on both near and far sides of the following locations: P1, P2, P3a, P3b, P4a, P5, P6, P7, P8a, and P8b welds. In addition, EVT-1 was

			performed on P4dC. No indications identified.
	2015 (2R13)	EVT-1	EVT-1 was performed on both near and far sides of the following locations: P1, P2, P3a, P3b, P4c, P5, P6, P7, P8a, and P8b. In addition, EVT-1 was performed on P4dD. No indications identified.
	2017 (2R14)	EVT-1	EVT-1 was performed in accordance with BWRVIP-18 Rev 2-A on both near and far sides of the following locations: P3aA, P4aA, P4bA, P4cA, P4dA, P5A, P6A, P7A, P8aA, and P8bA. No indications were identified.
Core Spray Piping Brackets	1999 (2R05)	EVT-1	EVT-1 of 2 piping support brackets PB-7 & PB-8. No indications identified.
	2001 (2R06)	EVT-1	EVT-1 of 2 piping support brackets PB-7 and PB-8. No indications identified.
	2003 (2R07)	EVT-1	EVT-1 of 3 piping support brackets PB-4, PB-5, and PB-6. No indications identified.
	2005 (2R08)	EVT-1	EVT-1 of 3 piping support brackets PB-1, PB-2, and PB-3. No indications identified.
	2007 (2R09)	EVT-1	EVT-1 of 2 piping support brackets PB-7 and PB-8. No indications identified.
	2009 (2R10)	EVT-1	EVT-1 of 2 piping support brackets PB-5 and PB-6. No indications identified.
	2011 (2R11)	EVT-1	EVT-1 of 2 piping support brackets PB3 and PB4. No indications identified.
	2013 (2R12)	EVT-1	EVT-1 of 2 piping support brackets PB1 and PB2. No indications identified.
	2015 (2R13)	EVT-1	EVT-1 of 2 piping support brackets PB7 and PB8. No indications identified.
	2017 (2R14)	EVT-1	EVT-1 of 2 piping support brackets PB5 and PB6. No indications identified.

Core Spray Sparger	1991 (2R01) – 1995 (2R03)	VT-1	Enhanced VT-1 (1 mil resolution) examination performed every refueling outage on piping and welds per IEB 80-13. No indications identified.
	1997 (2R04)	EVT-1	EVT-1 (1/2 mil resolution) examination of welds per IEB 80-13 and BWRVIP-18 baseline. No indications identified.
	1999 (2R05)	EVT-1	EVT-1 examination of welds S1A, S1B, S2aA, S2bA, S2aB, S2bB S4aA, S4bA, S4aB, and S4bB per BWRVIP-18. No indications identified.
		VT-1	VT-1 examination of welds S3aXXA, S3bXXA, and S3dXXA on nozzles 1A thru 65A. No indications identified.
	2001 (2R06)	EVT-1	EVT-1 examination of welds S1C, S1D, S2aC, S2bC, S2aD, S2bD, S4aC, S4bC, S4aD, and S4bD per BWRVIP-18. No indications identified.
		VT-1	VT-1 examination of welds S3aXXB, S3bXXB, and S3dXXB on nozzles 1B thru 65B. VT-1 examination of welds S3c4B, S3d4B, S3c62B, and S3d62B. No indications identified.
	2003 (2R07)	EVT-1	EVT-1 examination of welds S1A, S1B, S2aA, S2bA, S2aB, S2bB S4aA, S4bA, S4aB, and S4bB per BWRVIP-18. No indications identified.
		VT-1	VT-1 examination of welds S3aXXC, S3bXXC, and S3dXXC on nozzles 1C thru 65C. No indications identified.
	2005 (2R08)	EVT-1	EVT-1 examination of welds S1A, S1C, S1D, S2aA, S2aC, S2bC, S2aD, S2bD, S4aA, S4bA, S4aB, S4bB, S4aC, S4bC, S4aD, and S4bD per BWRVIP-18. No indications identified.
		VT-1	VT-1 examination of welds S3aXXD, S3bXXD, and S3dXXD on nozzles 1D

			thru 65D. VT-1 examination of welds S3c4D, S3d4D, S3c62D, and S3d62D. No indications identified.
	2007 (2R09)	EVT-1	EVT-1 of S1A, S1B, S2aA, S2aB, S2bA, S2bB, S4aA, S4aB, S4bA, and S4bB was performed. No indications were identified
		VT-1	VT-1 examination of welds S3aXXA, S3bXXA, and S3dXXA on nozzles 1A thru 65A was performed. No indications identified.
	2009 (2R10)	EVT-1	EVT-1 examination of welds S1C, S1D, S2aC, S2bC, S2aD, S2bD, S4aC, S4bC, S4aD, and S4bD was performed. No indications identified.
		VT-1	VT-1 examination of welds S3aXXB, S3bXXB, and S3dXXB on nozzles 1B thru 65B was performed. VT-1 examination of welds S3c4B, S3d4B, S3c62B, and S3d62B was performed. No indications identified.
	2011 (2R11)	EVT-1	EVT-1 examination of welds S1A, S1B, S2aA, S2aB, S2bA, S2bB, S4aA, S4aB, S4bA, and S4bB was performed. No indications were identified.
		VT-1	VT-1 examination of welds S3aXXC, S3bXXC, and S3dXXC on nozzles 1C thru 65C was performed. No indications identified.
	2013 (2R12)	EVT-1	EVT-1 exam of welds S1C, S1D, S2aC, S2aD, S2bC, S2bD, S4aC, S4aD, S4bC, and S4bD was performed. No indications were identified.
		VT-1	VT-1 exam of welds S3aXXD, S3bXXD, and S3dXXD on nozzles 1D thru 65D was performed. VT-1 exam of welds S3c4D, S3d4D, S3c62D, and S3d62D was performed. No indications identified.

	2015 (2R13)	EVT-1	EVT-1 examination of welds S1A, S1B, S2aA, S2aB, S2bA, S2bB, S4aA, S4aB, S4bA, and S4bB was performed. No indications were identified.
		VT-1	VT-1 exam of welds S3aXXA, S3bXXA, and S3dXXA on nozzles 1A thru 65A was performed. No indications were identified.
	2017 (2R14)	VT-3	VT-3 examination was performed in accordance with BWRVIP-18 Rev 2-A of welds S3aXXB, S3bXXB, and S3dXXB on nozzles 1B thru 65B. Additionally, S3c4B, S3c62B, S3d4B, and S3d62B were inspected via VT-3 method. No indications were identified.
Core Spray Sparger Brackets	1999 (2R05)	VT-1	VT-1 examination of sparger brackets SB1, SB2, and SB3. No indications identified.
	2001 (2R06)	VT-1	VT-1 examination of sparger brackets SB4 through SB12. No indications identified.
	2003 (2R07)	VT-1	VT-1 examination of sparger brackets SB1 through SB6. No indications identified.
	2005 (2R08)	VT-1	VT-1 examination of sparger brackets SB7, SB8, and SB9. One indication, a slightly bent sparger bracket, was identified on SB8 and was evaluated as acceptable.
	2007 (2R09)	VT-1	VT-1 examination of sparger brackets SB1, SB2, SB3, SB4, SB5, SB6, SB8, SB10, SB11, and SB12 was performed. The middle bracket of SB5 was identified as being offset to the right of the top bracket. This was evaluated as acceptable. SB8 was re-inspected with no change in condition from 2R08.
	2009 (2R10)	VT-1	VT-1 examination of sparger brackets SB7, SB8, SB9, SB10, SB11, and SB12

			was performed. One additional scrape on pipe at SB8 bracket was identified and evaluated as acceptable. No other indications were identified.
	2011 (2R11)	VT-1	VT-1 examination of sparger brackets SB1, SB2, SB3, SB4, SB5, SB6, and SB8 was performed. The middle bracket of SB5 was identified with a small scrape from pipe movement. This was evaluated as acceptable. SB8 was re-inspected with no change in condition. No other indications identified.
	2013 (2R12)	VT-1	VT-1 examination of sparger brackets SB05, SB07, SB08, SB09, SB10, SB11, and SB12 was performed. SB05 and SB08 were re-inspected with no change in previous conditions. No other indications identified.
	2015 (2R13)	VT-1	VT-1 examination of sparger brackets SB01, SB02, SB03, SB04, SB05, and SB06 was performed. SB05 was re-inspected with no change in previous rub mark/scrape. No other indications were identified.
	2017 (2R14)	VT-1	VT-1 examination of sparger brackets SB05 and SB08 were performed. Two previously undocumented minor rub marks were identified on SB05 and evaluated as acceptable. SB08 did not have any new or changed indications.
Top Guide (Rim, etc.)	1991 (2R01)	VT-3	VT-3 examination of accessible welds and surfaces. No indications identified.
	1993 (2R02)	VT-3	VT-3 examination of accessible welds and surfaces. No indications identified.
	1995 (2R03)	VT-1	VT-1 examination of accessible welds and surfaces at cells 14-23, 22-31, 22-39, 38-23, and 38-47.

		VT-3	VT-3 examination of 32 wedges, bolts, and keepers. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination of surfaces at cell locations 26-27 & 30-31 and VT-3 examination of radial restraints, 32 wedges, bolts, and keepers. No indications identified.
	2005 (2R08)	VT-3	VT-3 examination of all four Top Guide C-Clamps. No indications identified.
	2011 (2R11)	EVT-1	EVT-1 examination of 5 top guide cell locations: 34-27, 34-51, 42-15, 46-55, and 58-39. These inspections are credited as baseline exams for BWRVIP-183. No indications identified.
	2013 (2R12)	EVT-1	EVT-1 examination of 14 top guide cell locations: 10-19, 10-43, 14-35, 18-15, 18-43, 18-47, 26-35, 38-19, 38-31, 42-19, 42-43, 42-47, 50-19, and 50-43. These inspections are credited as baseline exams for BWRVIP-183. No indications identified.
	2015 (2R13)	VT-3	VT-3 examination of all four Top Guide C-Clamps. No indications identified.
Core Plate (Rim, etc.)	1995 (2R03)	VT-3	VT-3 examination of accessible welds and surfaces at core locations 14-23, 22-31, 22-39, 38-23, and 38-47. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination of accessible welds & surfaces at core plate location 30-31. No indications identified.
SLC			N/A, SLC connects to Core Spray System. (See summary of Instrument Penetrations)
Jet Pump Assembly	1991 (2R01)	VT-3	VT-3 examination of all 20 Jet Pump assemblies. No indications identified.
	1993 (2R02)	VT-3	VT-3 examination of all 20 Jet Pump assemblies. No indications identified.
	1995 (2R03)	VT-3	VT-3 examination of all 20 Jet Pump

			assemblies. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination of all 20 Jet Pump assemblies. No indications identified.
		UT	UT examination of all 20 Jet Pump hold down beams per BWRVIP-41. No indications identified.
		EVT-1	EVT-1 examination of welds RS-1, RS-2 and RS-3 per BWRVIP-41 on Jet Pumps 11 - 20. No indications identified.
	2001 (2R06)	EVT-1	EVT-1 examination of RB-1 and RB-2 welds on Jet Pumps 1 - 4. EVT-1 examination of IN-4 and MX-2 welds on Jet Pumps 2 - 4. EVT-1 examination of RS-1, RS-2, RS-6, RS-7, RS-8, and RS-9 welds of Jet Pumps 3 - 4. No indications identified.
	2003 (2R07)	EVT-1	EVT-1 examination of welds RS-1 and RS-2 welds on Jet Pumps 1, 2, 5, and 6. EVT-1 examination of RS-3 welds on JPs 1 - 10. EVT-1 examination of welds RS-6, RS-7, RS-8, and RS-9 on Jet Pumps 1, 2, 5, 6, and 11 - 14. EVT-1 examination of IN-4 and MX-2 on Jet Pumps 1, 5, 6, and 11 - 14. No indications identified.
	2005 (2R08)	UT	UT examination of all 20 Jet Pump hold down beams (BB-1, BB-2, and BB-3) per BWRVIP-41. Supplemental EVT-1 of the BB-2 location on Jet Pumps 1 and 2 due to UT fixture seating issues on the 90-degree placement only. No indications identified.

		EVT-1	EVT-1 examination of RS-3 welds on Jet Pumps 11 - 14. EVT-1 examination of RB-1 welds on Jet Pumps 7 through 10. EVT-1 examination of RB-2 welds on Jet Pumps 7 and 8. EVT-1 examination of RS-1, RS-2, RS-6, and RS-7 welds of Jet Pumps 7 - 10. EVT-1 examination of IN-4 and MX-2 welds of Jet Pumps 7 and 8. EVT-1 examination of RS-8 and RS-9 welds of Jet Pumps 1 - 4, 7 - 14, and 17 - 20. No indications identified.
		VT-1	A VT-1 examination of 8 wedges (WD-1 on Jet Pumps 2, 6 - 10, 16, and 18) in the original scope identified significant wedge wear. The scope was expanded to all remaining wedges and setscrew gaps (AS-1 and AS-2) were measured on all 20 Jet Pumps. Jet Pumps 1, 2, 4, 8, 10 - 14, 17, 19, and 20 showed main wedge wear and set screw gaps were identified on all Jet Pumps with the exception of Jet Pump 3, 6, and 7. The largest setscrew gap was 31 mils on Jet Pump 18 (with no wear). For those wedges that had identified wear, MX-7, WD-2a/b, RS-8, and RS-9 welds were examined with no further degradation identified. Jet Pump slip joint clamps were installed on all 12 Jet Pumps with identified wear. Also, 13 Auxiliary wedges were installed where gaps exceeded the acceptance criteria.
	2007 (2R09)	EVT-1	EVT-1 inspection was performed on the RS-6 welds of JP 1, 9, 11, 17, and 19 and on the RS-7 welds of JP 2, 4, 8, 12, 14,

			and 20. EVT-1 inspection was performed on the RS-8 and RS-9 welds of JP 1/2, 3/4, 7/8, 9/10, 11/12, 13/14, 17/18, and 19/20. EVT-1 inspection was performed on RB-2 welds on JP 9/10, and RB-1 and RB-2 welds on JP 15/16. Also, RB-1a and RB-1c welds on JP 17/18 were examined by EVT-1. EVT-1 inspection was performed on RS-1 and RS-2 welds on JP 17/18. No indications were identified.
		VT-1	A VT-1 examination of all 20 main wedges (WD-1) was performed. The main wedges associated with JP 1, 12, 17, and 20 were replaced with an oversized wedge and the corresponding restrainer brackets were resurfaced. 10 of 12 jet pumps with previously identified wedge wear from 2R08 showed minor additional wedge wear in 2R09 even though a slip joint clamp was installed. JP 9 main wedge was identified with new wedge wear (low) but had no wedge wear identified in the previous cycle. All setscrews were inspected for gaps, except for JP 14. Gaps were identified on the vessel side of JP 4, 5, 7, 9, and 20 with the largest gap being 0.030 inch (JP 7). For those wedges that had newly identified wedge wear (JP 9) or additional wedge wear (JP 1, 2, 4, 8, 11, 12, 14, 17, 19, and 20), the MX-7, WD-2a/b, RS-6 or RS-7, RS-8 and RS-9 welds, as applicable, were examined as required expanded scope. Minor wedge rod wear was identified on JP 2, 4, 9, 11, and 19. No other indications were identified.

		VT-3	A VT-3 examination was performed on all previously install Auxiliary Wedges (AW) and Slip Joint Clamps (SJC). Minor wear was identified on the AW installed on JP 1, 10, 11, and 13. Aux wedges were removed and not reinstalled on JP 1 and 17. Aux wedges were installed on both the vessel side and shroud side of JP 2, 4, 11, 14, and 19. One aux wedge was installed on the vessel side of JP 7 and 9, and one was installed on the shroud side of JP 12 after reassembly identified a 0.043 inch gap. Jet Pump SJC were inspected by VT-3 with no indications and were installed on JP 3, 5, 6, 7, 9, 15, 16, and 18. All 20 jet pumps now have a SJC installed.
	2009 (2R10)	EVT-1	EVT-1 inspection was performed on the RS-3 welds of JP 15/16, 17/18, and 19/20. EVT-1 inspection was performed on the RS-6 welds of JP 3 and 15 and on the RS-7 welds of JP 4, 6, 12, 14, 16, 18, and 20. EVT-1 inspection was performed on the RS-8 and RS-9 welds of JP 3/4, 5/6, 11/12, 13/14, 15/16, 17/18, and 19/20. EVT-1 inspection was performed on the IN-4 and MX-2 welds of JP 9, 10, 15, 16, 17, 18, 19, and 20. EVT-1 inspection was performed on RB-2 welds on JP 17/18 and 19/20, and RB-1 welds on JP 19/20. Also, RB-1b and RB-1d welds on JP 17/18 were EVT-1 examined. EVT-1 inspection was performed on RS-1 and RS-2 welds on JP 19/20.

			No indications were identified.
		VT-1	A VT-1 examination of all 20 main wedges (WD-1) was performed. The main wedges associated with JP 2, 8, 14, and 19 were replaced with a standard replacement wedge (wider than original) and the corresponding restrainer brackets had repair plates installed to increase the wedge bearing surface. In addition, restrainer bracket repair plates were also installed on JP 12 to raise the height of the main wedge to an acceptable level. JP 4 and 14 had previously identified wedge wear from 2R09 and showed minor additional wear in 2R10. JP 3, 6, and 18 were identified with new wedge wear but had no wedge wear identified in the previous cycle. JP 1, 12, and 20 had main wedge movement identified between 2R09 and 2R10. All set screws were inspected for gaps. Gaps were identified on the vessel side (VS) of JP 3 and JP 5 of 0.012 inch. One auxiliary wedge was required to be installed on the VS setscrew of JP 3. For those wedges that had new or additional wedge wear or movement (JP 3, 4, 6, 12, 14, 18, and 20), the MX-7, WD-2a/b, RS-6 or RS-7, RS-8 and RS-9 welds, as applicable, were examined as required expanded scope. No change in minor wedge rod wear on JP 2, 4, 9, and 14. New wedge rod wear identified on JP 3, 6, 12, 18, and 20. Minor additional rod wear identified on JP 11 and 19. Slip joint clamps (SJC) were inspected on all 20 jet pumps. JP 1, 4, and 11 SJCs were identified with wear of the center strut into the diffuser collar. JP 1 and 11

			SJCs were repositioned during 2R10. JP 7 SJC was identified as being improperly installed but acceptable. JP 12 SJC was identified as having moved during the previous cycle but was acceptable as-is. No other indications were identified.
		VT-3	VT-3 examination was performed on JP 1, 12, 17, and 20 hold down beams after one cycle of installation as a post-mod exam. VT-3 examination was performed on the following vessel side (VS) or shroud side (SS) auxiliary wedges either as a post-mod exam or as part of expanded scope due to wedge wear: JP 2 VS, JP 2 SS, JP 4 VS, JP 4 SS, JP 7 VS, JP 8 VS, JP 8 SS, JP 9 VS, JP 10 VS, JP 11 VS, JP 11 SS, JP 12 SS, JP 13 VS, JP 14 VS, JP 14 SS, JP 18 VS, JP 19 VS, and JP 19 SS. No change in auxiliary wedge wear was identified on JP 10 VS or JP 13 VS. Movement was identified on JP 11 VS and JP 11 SS auxiliary wedges. No other indications were identified.
		UT	UT examination of 16 of 20 Jet Pump hold down beams (BB-1, BB-2, and BB-3) was performed. The remaining 4 beams are of the group 3 design and not yet required to be examined. No indications identified.
	2011 (2R11)	EVT-1	EVT-1 examination was performed on all 10 Jet Pump RS-9 welds. One indication was identified on the RS-9 weld of JP 1/2 riser. The indication was 0.43 inches and was evaluated to be acceptable. EVT-1 exam on IN-4 welds of JP 1 and 2. EVT-1 exam on RB-1 and RB-2 welds on JP1/2 riser. EVT-1 exam of RS-1, RS-2, RS-3, RS-6,

			RS-7, and RS-8 welds on Jet Pump 1/2 riser. EVT-1 exam of RS-8 weld on JP 7/8 and 9/10 risers. EVT-1 exam of RS-1 and RS-2 on JP15/16 riser. No indications identified, except one noted above.
		VT-1	A VT-1 examination of all 20 main wedges (WD-1) was performed. The main wedges associated with JP 4, 9, 10, and 13 were replaced with a standard replacement wedge (wider than original) and the corresponding restrainer brackets had repair plates installed to increase the wedge bearing surface. In addition, restrainer bracket repair plates were also installed on JP 1 and JP 17 to restore the restrainer pad bearing surface contact. No new main wedge wear was identified. No change in previous wedge wear on JP 2, 3, 4, 6, 10, 11, 17, 18, and 20. JP 1, 9, 13, and 19 had main wedge movement identified in 2R11. All unmodified setscrews were inspected for gaps. A gap of 0.014 inch was identified on the vessel side (VS) of JP 5. One auxiliary wedge was required to be installed on the VS setscrew of JP 6 to repair a 0.022 inch gap. No change in minor wedge rod wear on JP 3, 6, 11, 18, and 20. New wedge rod wear identified on JP 1, 2, 5, 16, and 19. Minor additional rod wear identified on JP 4, 12, and 13. Slip joint clamps (SJC) were inspected on all 5 jet pumps: JP 1, 4, 7, 11, and 12. No change in previous conditions noted.

			No other indications were identified.
		VT-3	VT-3 examination was performed on the following vessel side (VS) or shroud side (SS) auxiliary wedges as part of re-inspection requirements: JP 2 VS, JP 2 SS, JP 3 VS, JP 8 VS, JP 8 SS, JP 10 VS, JP 11 VS, JP 11 SS, JP 12 SS, JP 13 VS, JP 14 VS, JP 14 SS, JP 19 VS, and JP 19 SS. No change in auxiliary wedge wear was identified on JP 10 VS or JP 13 VS. Minor movement noted in JP 11 VS aux wedge. VT-3 examination also performed on restrainer bracket plate hardware after one cycle of operation on JP 2, 8, 12, 14, and 19. No other indications were identified.
	2013 (2R12)	EVT-1	EVT-1 exam on all 10 RS-9 locations was performed. One previous indication at JP01/02 RS-9 weld was identified as essentially no change; however, the indication was re-measured to be 0.53 in. and was re-evaluated to be acceptable. EVT-1 exam on IN-4 weld of JP04 was performed. EVT-1 exams on RB-1, RS-7 and RS-8 welds of JP19/20 were performed. Also, JP20 MX-7 weld was inspected. EVT-1 exams of RS-1 and RS-2 welds on JP11/12 were performed. EVT-1 exams of RS-3, RS-6, RS-7, and RS-8 welds on JP03/04 riser were performed. No indications identified, except one noted above.

		VT-1	A VT-1 examination of all 20 main wedges (WD-1) was performed. The main wedges associated with JP03, JP06, JP11, and JP18 were replaced with a standard replacement wedge (wider than original) and the corresponding restrainer brackets had repair plates installed to increase the wedge bearing surface. In addition, restrainer bracket repair plates were also installed on JP20 to restore the restrainer pad bearing surface contact. No new main wedge wear was identified, except on JP20. Expanded scope inspections were performed on JP20 per BWRVIP-41. No change in previous wedge wear identified on JP03, JP05, JP06, JP11, JP12, and JP18. JP10 and JP19 had main wedge movement identified in 2R12. No change in minor wedge rod wear on JP03, JP05, JP06, JP11, JP12, JP16, JP18, and JP19. New or additional wedge rod wear identified on JP01, JP10, JP17, and JP20. All setscrew locations without aux wedges were inspected for gaps. A gap of 0.012" and 0.009" was identified and evaluated as acceptable on JP05 VS and JP17 VS, respectively. A gap of 0.017" was identified on JP01 VS. The main wedge on JP01 was tapped down and the gap closed to zero. JP12 VS setscrew was found with minor wear into the bellyband and evaluated as acceptable. Slip joint clamps (SJC) were inspected on JP01, JP02, JP04, JP07, JP08, JP10, JP11, JP12, JP13, JP14, JP19, and JP20. No change in previously identified condition on JP04 SJC and JP12 SJC. New or additional minor wear identified on JP01 SJC, JP07 SJC, and JP11 SJC. All

			conditions were evaluated as acceptable without repair. Slip joint areas were also inspected for gaps on JP01, JP04, JP08, JP11, JP12, and JP17 in accordance with GE SC12-12 and SC12-14. No indications were identified.
		VT-3	VT-3 examination was performed on the following vessel side (VS) or shroud side (SS) auxiliary wedges as part of re-inspection requirements: JP04 SS, JP04 VS, JP06 VS, JP09 VS, JP10 VS, JP11 SS, JP11 VS, JP13 VS, JP15 VS, JP16 VS, and JP18 VS. Additional wear into the belly band was identified on JP10 VS and JP18 VS aux wedge. New wear into the restrainer bracket guide fin was identified on JP04 VS, JP06 VS, JP09 VS, JP11 SS, and JP18 VS aux wedges. New wear between the blades was identified on JP11 VS aux wedge. Movement was noted on JP13 VS, JP15 VS, and JP16 VS aux wedges. All indications were evaluated as acceptable for continued operation. VT-3 examination also performed on restrainer bracket plate hardware after one cycle of operation on JP01, JP04, JP09, JP10, JP13, and JP17. No other indications were identified.
	2015 (2R13)	EVT-1	EVT-1 exam on RS-9 on JP01/02 was performed. One previous indication was identified as no change in condition and evaluated to be acceptable. EVT-1 exams of RB-1 and RB-2 welds of JP03/04 and JP09/10 were performed. EVT-1 exams of RS-3 on JP05/06, JP07/08, and JP09/10 were performed.

			EVT-1 exams of RS-6 and RS-7 on JP09/10 were performed. EVT-1 exams of RS-8 and RS-9 on JP11/12 were performed. EVT-1 exam on IN-4 welds of JP11 and JP12.
		VT-1	A VT-1 examination of all 20 main wedges (WD-1) was performed. The main wedges associated with JP05, JP07, JP15, and JP16 were replaced with a standard replacement wedge (wider than original) and the corresponding restrainer brackets had repair plates installed to increase the wedge bearing surface. This completes the replacement main wedge and plate modification to all 20 jet pumps. New, very slight main wedge wear was identified on JP20. No change in minor wedge rod wear on JP05 or JP19. New or additional wedge rod wear identified on JP01, JP04, JP10, JP11, JP12, JP13, JP15, JP16, and JP17. Slip joint clamps (SJC) were inspected on JP01, JP03, JP04, JP05, JP06, JP07, JP09, JP11, JP12, JP15, JP16, JP17, and JP18. No change in previously identified condition on JP01, JP04, JP07, JP11, or JP12. New or additional minor wear identified on JP17. All conditions were evaluated as acceptable without repair. Set Screw gaps (AS-1) were inspected at all locations except where auxiliary wedges were installed. No gaps or changes in previous conditions were identified with the exception of JP01 VS (slight rolled metal), JP03 VS (0.012 in), JP05 VS (0.011 in) and JP17 VS (0.005 in).
		VT-3	All Auxiliary Wedges were inspected utilizing a VT-3 visual method. No

			changes in previous conditions were noted with the exception of new or additional wear identified on the VS aux wedges at JP02, JP03, JP04, JP07, JP09, JP10, JP13, JP14, and JP19. These indications were evaluated as acceptable The VS aux wedge at JP11 was replaced in 2R13 due to wear into the fingers and an over travel condition. The VS aux wedge at JP03 was removed due to wear and not replaced. The as-left gap was 0.012 inches which is acceptable. The restrainer bracket plates that were installed the cycle before had a baseline inspection performed this outage. There were no indications identified on the plates that were installed on JP03, JP06, JP11, JP18, and JP20.
		UT	A UT examination was performed on 16 of 20 Jet Pump hold down beams in three areas (BB-1, BB-2, and BB-3). The remaining 4 beams are of the Group 3 design and not yet required to be examined. Supplemental EVT-1 of Jet Pump 3 and 9 was performed to confirm non-relevant indications identified during the UT. No relevant indications were identified.
	2017 (2R14)	EVT-1	EVT-1 exams of the following welds were completed: • MX-2 welds on JP1 and JP2 • RS-3 welds on JP11/12 and JP13/14 risers • RS-6 weld on JP5 • RS-7 welds on JP2, JP6, JP8, and JP10 • IN-4 welds on JP3, JP13, and JP14 • RB-1, RB-2, RS-1, and RS-2 welds on JP7/8 riser • RS-8 and RS-9 welds on all 10 risers No change identified to the RS-9 indication on JP01 side of the riser. A

			previously unidentified indication on JP02 side of RS-9 was found and measured to be 0.228" in length. This indication was evaluated as acceptable for continued operation. No other indications were identified from the above listed exams. A VT-1 examination of all 20 main wedges (WD-1) was performed. New, minor main wedge wear was identified on JP2, JP6, JP8, and JP10. No change in condition on JP20 main wedge. Scope was expanded to WD-2a, WD-2b, RS-7, RS-8, and RS-9 for each location. No indications were identified. No change in minor wedge rod wear on JP04, JP10, JP13, JP17, JP19, and JP20. New or additional wedge rod wear identified on JP01, JP02, JP11, JP12, and JP18.
		VT-1	Set Screw gaps (AS-1) were inspected at all locations except where auxiliary wedges were installed. No gaps or changes in previous conditions were identified with the exception of: • JP01 (VS) (slight wear into bellyband), • JP01 (SS) (slight wear into bellyband), • JP02 (VS) (gap 0.011 inches), • JP03 (VS) (gap 0.008 inches), • JP04 (VS) (gap 0.013 inches), • JP05 (VS) (gap 0.011 inches), • JP05 (SS) (slight wear into bellyband), • JP12 (SS) (gap 0.006 inches), • JP14 (VS) (gap 0.014 inches), and • JP17 (VS) (gap 0.003 inches). All conditions and indications were evaluated as acceptable.
		VT-3	All Auxiliary Wedges were inspected utilizing a VT-3 visual method. No changes in previous conditions were noted with the exception of new or additional wear identified on the SS aux wedges at JP04, JP08, JP11 and JP12, and VS aux

			wedges at JP07, JP09, JP10, JP11, JP13, and JP14. These indications were evaluated as acceptable or removed from service. The VS aux wedges at JP02, JP04, and JP14 and the SS aux wedge at JP12 were removed due to wear and not replaced. The as-left gap measurements were less than 0.015 inches which is acceptable. Several restrainer bracket plates were inspected via VT-3 method. A slight gap was identified between the lower plate boss and the restrainer bracket on JP02, JP08 and JP14 plates. There were no indications identified on any other plates that were inspected. VT-3 exams of slip joint clamps (SJCs) on all 20 jet pumps were completed. SJC wear and/or gaps were identified on 15 of 20 clamps (JP01, JP02, JP04, JP06, JP07, JP08, JP10, JP11, JP12, JP13, JP14, JP16, JP17, JP18, and JP20). Subsequently, the preload was increased up to 1000 lbs on all 20 jet pump SJCs. Additionally, JP01 SJC was replaced with a new mirror image clamp due to wear at the center strut.
Jet Pump Diffuser	1991 (2R01)	VT- 3	VT-3 examination of all 20 Jet Pump assemblies. No indications identified.
	1993 (2R02)	VT- 3	VT-3 examination of all 20 Jet Pump assemblies. No indications identified.
	1995 (2R03)	VT- 3	VT-3 examination of all 20 Jet Pump assemblies. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination of all 20 Jet Pump assemblies. No indications identified.
	2001 (2R06)	EVT-1	EVT-1 examination of DF-1, DF-2, AD-1, and AD-2 welds on Jet Pumps 2 - 4. No indications identified.

	2003 (2R07)	EVT-1	EVT-1 examination of DF-1, DF-2, AD-1, and AD-2 welds on Jet Pumps 1, 5, 6, and 11 - 14. No indications identified.
	2005 (2R08)	EVT-1	EVT-1 examination of DF-1, DF-2, AD-1, and AD-2 welds on Jet Pumps 7 and 8. No indications identified.
	2007 (2R09)	EVT-1	EVT-1 examination of DF-1, DF-2, AD-1, and AD-2 welds on JP 9, 10, and 15. No indications identified.
	2009 (2R10)	EVT-1	EVT-1 inspection was performed on the AD-1, AD-2, DF-1, and DF-2 welds of JP 16, 18, and 19. No indications identified EVT-1 inspection was performed on the DF-1 and DF-2 welds of JP 17 and DF-1 only of JP 20. No indications identified.
		UT	UT examination was performed on JP 17 AD-1 and AD-2 welds, as well as JP 20 AD-1, AD-2, and DF-2 welds. No indications identified.
	2011 (2R11)	UT	UT examination was performed on all 20 jet pumps at weld locations AD-1, AD-2, DF-1, DF-2, and MX-2, except for four DF-1 welds on JP 3, 8, 14, and 18. These four locations could not be UT examined due to vertical weld crown height issues on these jet pump diffusers. No indications identified.
	2017 (2R14)	EVT-1	EVT-1 exams of AD-1, AD-2, DF-1, and DF-2 welds on JP1 and JP2 were completed. No indications identified.
CRD Guide Tube	1991 (2R01)	VT-3	VT-3 examination of control rod assemblies at core positions 22-14 and 14-31. No indications identified.
	1993 (2R02)	VT-3	VT-3 examination of control rod assembly at core location 34-07. Minor scratches noted. Acceptable for continued service.

	1995 (2R03)	VT-3	VT-3 PSI examination of replacement CRDs at core locations 06-19, 10-27, 10-47, 14-39, 18-03, 18-15, 18-55, 22-35, 22-39, 30-51, 34-47, 38-15, 38-27, 38-39, 42-43, 46-39, 46-43, 50-15, and 54-35. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination of CRD guide tube accessible surfaces of 26-27 from ID and 30-31 from OD. No indications identified.
	2003 (2R07)	EVT-1/ VT-3	CRD guide tube welds were examined at core locations 06-19, 06-43, 18-43, 22-31, 30-23, 30-39, 38-31, 42-19, 42-43, and 54-43. This includes a VT-3 of CRGT-1 welds, an EVT-1 of CRGT-2 and CRGT-3 welds, and a VT-3 of CR/FS/GT - ARPIN-1 welds for the above locations. No indications identified.
	2007 (2R09)	EVT-1/ VT-3	CRD guide tube welds were examined at core locations 18-27, 18-35, 26-27, 42-27, and 42-35. This includes an EVT-1 of CRGT-2 and CRGT-3 welds. A VT-3 of the CRGT-1 and ARPIN-1 welds was credited via CRB removal/reinstallation procedure. No indications identified.
	2009 (2R10)	EVT-1/ VT-3	CRD guide tube welds were examined at core locations 06-31, 18-19, 26-43, and 34-43. This includes an EVT-1 of CRGT-2 and CRGT-3 welds. A VT-3 of the CRGT-1 and ARPIN-1 welds was credited via CRB removal/reinstallation procedure. No indications identified.
CRD Stub Tube	1993 (2R02)	VT-3	VT-3 examination of stub tube to vessel weld and stub tube to housing weld at azimuth 300 deg. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination at core location 30-31, 30-35, 26-31 & 34-31. No indications identified.
	2007 (2R09)		Best effort VT-1 / VT-3 of stub tube to vessel welds and stub tube to housing

		Best effort VT-1 / VT-3	welds at core locations 02-39, 02-43, 06-47, 10-11, 14-07, 14-11, 38-59, 42-59, and 46-55 were examined via access through the disassembly of Jet Pumps 1, 12, and 17. No indications were identified.
	2017 (2R14)	VT-3	VT-3 exams were performed on stub tube to vessel welds (ST/RPV-1), stub tube to CRD housing welds (CRDH/ST-1), and CRD housing to cap welds (CRDH-1) at core locations 22-31, 26-27, 26-31, 26-35, 30-23, 30-27, 30-31, and 34-27 via access through cell disassembly due to required plugging to support bottom head drain valve repairs. No indications were identified.
In-Core Housing	1999 (2R05)	VT-3	VT-3 examination of housings, guide tubes, stabilizers & housing to RPV welds at core locations 24-29 & 32-29. No indications identified.
	2017 (2R14)	VT-3	VT-3 exams were performed on in-core housing to vessel welds (ICH/RPV-1) and in-core guide tube to housing welds (ICHGT/ICH-1) at core locations 24-29, 24-33, 32-25, and 32-29 via access through cell disassembly due to required plugging to support bottom head drain valve repairs. No indications were identified.
Dry Tube	1995 (2R03)	VT-1	VT-1 examination of accessible portions of upper 2 feet of dry tube at core locations 16-21, 40-21, 40-45, 24-29, 24-37, and 32-37. No indications identified.
	1999 (2R05)	VT-1	VT-1 examination of accessible portions of upper 2 feet of dry tube at core locations 24-29 & 32-29. No indications identified.
	2005 (2R08)	VT-1	VT-1 examination of accessible portions of upper 2 feet of dry tube at core locations 16-13, 16-21, 16-45, 24-29, 40-21, and 48-13. No indications identified.

	2007 (2R09)	Replaced	IRM 24-29, 24-37, 32-39, 48-53, and SRM 16-45, 40-21 were replaced with new universal style dry tubes. The remaining 6 are scheduled for replacement in 2009 (2R10).
	2009 (2R10)	Replaced	IRM 16-13, 16-53, 32-37, 48-13, and SRM 16-21, 40-45 were replaced with new universal style dry tubes.
	2013 (2R12)	Replaced	IRM 32-29 (2E IRM) was replaced with a new universal style dry tube due to significant unexpected dose rates that were found when attempting to replace the detector. The detector was left partially inserted in its dry tube and the dry tube and all was removed from the refuel floor.
Instrument Penetrations	1991 (2R01)	VT-3	VT-3 examination of interior attachment of instrument nozzles N11A, N11B, and N12A through N12D. No indications identified.
		PT	PT examination performed on all instrument nozzle to safe end welds once per interval, per Section XI (Includes N10 Core Differential Pressure penetration). No indications identified.
	1999 (2R05)	UT/PT	UT & PT examination of jet pump instrument nozzle to safe end N8A & N8B. No indications identified.
	2009 (2R10)	VT-2	VT-2 examinations of instrument nozzles N11A-B, N12A-D, and N16A-D were performed during the system leakage test.
	2011 (2R11)	VT-2	VT-2 examinations of instrument nozzles N11A-B, N12A-D, and N16A-D were performed during the system leakage test.
	2013 (2R12)	VT-2	VT-2 examinations of instrument nozzles N11A-B, N12A-D, and N16A-D were performed during the Class 1 system leakage test.

	2015 (2R13)	VT-2	VT-2 examinations of instrument nozzles N11A-B, N12A-D, and N16A-D were performed during the Class 1 system leakage test. The N16D nozzle was found with minor leakage during the pressure test. The original Alloy 600 nozzle was partially removed and an Alloy 690 half-nozzle repair was performed. No other indications were identified.
Vessel ID Brackets	1991 (2R01)	VT-1/ VT-3	VT-1 or VT-3 performed on all ID bracket welds once every other outage per Section XI. No indications identified.
	1993 (2R02)	VT-1/ VT-3	VT-1 or VT-3 performed on all ID bracket welds once every other outage per Section XI. No indications identified.
	1995 (2R03)	VT-1/ VT-3	VT-1 or VT-3 performed on all ID bracket welds once every other outage per Section XI. No indications identified.
	1997 (2R04)	VT-1/ VT-3	VT-1 or VT-3 performed on all ID bracket welds once every other outage per Section XI. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination of feedwater sparger brackets (5, 55, 65, 115, 125, 175, 185, 235, 245, 295, 305 & 355 DEG), including bracket weld to RPV. No indications identified.
	2001 (2R06)	EVT-1	EVT-1 examination of feedwater sparger brackets at 5 degrees and 175 degrees, and core spray sparger brackets at 274.5 degrees and 345 degrees. No indications identified.
	2003 (2R07)	EVT-1	EVT-1 examination of feedwater sparger brackets at 65 degrees and 115 degrees; core spray sparger brackets at 165 degrees, 195 degrees, and 247.5 degrees; steam dryer support brackets at 4 degrees and 94 degrees; and jet pump riser brace arm attachment welds at jet pumps 1/2, 3/4, 5/6, 11/12, and 13/14. No indications identified.

		VT-1	VT-1 examination of the 30 degree surveillance sample holder attachment to vessel weld. No indications identified.
	2005 (2R08)	EVT-1	EVT-1 examination of feedwater sparger brackets at 55 degrees and 125 degrees; core spray sparger brackets at 15 degrees, 85.5 degrees, and 112.5 degrees; and jet pump riser brace arm attachment welds at jet pumps 7/8 and 9/10. No indications identified.
		VT-3	VT-3 examination of guide rod bracket attachment welds at 0 degrees and 180 degrees. No indications identified.
	2007 (2R09)	EVT-1	EVT-1 examination was performed for core spray piping brackets at 274.5 Az. and 345 Az, feedwater sparger end brackets at 185 Az. and 235 Az., and jet pump riser brace arm attachment welds at JP 15/16. No indications were identified.
		VT-1	VT-1 examination was also performed on jet pump riser brace arm attachment welds at JP 15/16 (for Code credit), and at the upper and lower surveillance specimen brackets at 120 Az. and 300 Az.
		VT-3	VT-3 examination was also performed on core spray piping brackets at 274.5 Az. and 345 Az, and feedwater sparger end brackets at 185 Az. and 235 Az.(for Code credit). No indications were identified.
	2009 (2R10)	EVT-1	EVT-1 examination was performed for core spray piping brackets at 195° and 247.5°, feedwater sparger end brackets at 245°, 295°, 305°, and 355°, jet pump riser brace arm attachment welds at JP 17/18 and 19/20, and steam dryer support brackets at 184° and 274°. No indications were identified.

	2011 (2R11)	EVT-1	EVT-1 examination was performed for core spray piping brackets at 112.5° and 165°, feedwater sparger end brackets at 5°, 55°, 65°, and 115°, and jet pump riser brace arm attachment welds at JP 1/2 and 11/12. No indications were identified.
		VT-1/ VT-3	VT-1 exam of the upper attachment weld and VT-3 of lower attachment weld for the 30 deg surveillance specimen holder. No indications identified.
	2013 (2R12)	EVT-1	EVT-1 examination was performed for core spray piping brackets at 15° and 85.5°, feedwater sparger end brackets at 125° and 175°, jet pump riser brace attachment welds at JP 13/14, and steam dryer support bracket welds at 4° and 94°. No indications were identified.
	2015 (2R13)	EVT-1	EVT-1 examination was performed for core spray piping brackets at 15° and 85.5°, feedwater sparger end brackets at 125° and 175°, jet pump riser brace attachment welds at JP 13/14, and steam dryer support bracket welds at 4° and 94°. No indications were identified.
		VT-1	VT-1 examination of the lower surveillance specimen bracket attachment welds at 120 Az and 300 Az. No indications identified.
		VT-3	VT-3 examination of guide rod bracket attachment welds at 0 Az and 180 Az and the upper surveillance specimen bracket attachment welds at 120 Az and 300 Az. No indications identified.
	2017 (2R14)	EVT-1	EVT-1 examination was performed for core spray piping bracket attachment welds at 195° and 247.5°, jet pump riser brace attachment welds at JP 07/08, feedwater sparger end brackets at 245° and 295°, and a steam dryer support bracket

			weld at 184°. No indications were identified.
		VT-3	VT-3 examinations were performed on core spray piping bracket attachment welds at 195° and 247.5°, feedwater sparger end brackets at 245° and 295°, and a steam dryer support bracket weld at 184° (Code Credit). No indications identified.
LPCI Coupling	1991 (2R01)	VT-3	VT-3 examination of all 4 couplings. No indications identified.
	1995 (2R03)	VT-3	VT-3 examination of all 4 couplings. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination of all 4 couplings. No indications identified.
	2001 (2R06)	EVT-1	EVT-1 examination of 'C' and 'D' LPCI 45-3b welds. No indications identified.
	2003 (2R07)	EVT-1	EVT-1 examination of 'A' and 'B' LPCI 45-3b welds and EVT-1 examination of 'A', 'B', 'C', and 'D' LPCI 45-12 welds. No indications identified.
	2005 (2R08)	EVT-1	EVT-1 examination of 'A', 'B', 'C', and 'D' LPCI 45-3b and 45-12 welds. No indications identified.
		VT-3	VT-3 examination of 'D' LPCI 45-6a through 45-6d welds. No indications identified.
		VT-1	VT-1 examination of 'D' LPCI 45-8a through 45-8d welds. No indications identified.
	2007 (2R09)	EVT-1	EVT-1 examination of 'C' and 'D' LPCI couplings (45-3b and 45-12) welds was performed. No indications identified.
		VT-3	VT-3 examination of 'C' LPCI 45-6a through 45-6d welds. No indications identified.

		VT-1	VT-1 examination of 'C' LPCI 45-8a through 45-8d welds. No indications identified.
	2009 (2R10)	EVT-1	EVT-1 examination of 'B' LPCI coupling (45-3b and 45-12) welds was performed. No indications identified.
		VT-3	VT-3 examination of 'B' LPCI 45-6a through 45-6d welds. No indications identified.
		VT-1	VT-1 examination of 'B' LPCI 45-8a through 45-8d welds. No indications identified.
	2011 (2R11)	EVT-1	EVT-1 exam of 'A' LPCI coupling (45-3b and 45-12) welds was performed. No indications identified.
		VT-3	VT-3 exam of 'A' LPCI 45-6a through 45-6d welds. No indications identified.
		VT-1	VT-1 exam of 'A' LPCI 45-8a through 45-8d welds. No indications identified.
	2013 (2R12)	EVT-1	EVT-1 exam of 'D' LPCI coupling (45-3b and 45-12) welds was performed. No indications identified.
		VT-3	VT-3 exam of 'D' LPCI 45-6a through 45-6d welds. No indications identified.
		VT-1	VT-1 exam of 'D' LPCI 45-8a through 45-8d welds. No indications identified.
	2015 (2R13)	EVT-1	EVT-1 exam of 'C' LPCI coupling (45-3b and 45-12) welds was performed. No indications identified.
		VT-3	VT-3 exam of 'C' LPCI 45-6a through 45-6d welds. No indications identified.
		VT-1	VT-1 exam of 'C' LPCI 45-8a through 45-8d welds. No indications identified.

	2017 (2R14)	EVT-1	EVT-1 exam of 'B' LPCI coupling (45-3b and 45-12) welds was performed. No indications identified.
		VT-3	VT-3 exam of 'B' LPCI 45-6a through 45-6d welds was performed. No indications identified.
		VT-1	VT-1 exam of 'B' LPCI 45-8a through 45-8d welds was performed. No indications identified.
Steam Dryer	1995 (2R03)	VT-3	VT-3 examination of overall Steam Dryer assembly. Linear indications were identified in the support ring during the VT-1 of the adjacent drain channel welds. These indications were accepted by engineering evaluation.
	1997 (2R04)	UT	UT examination performed to determine baseline crack depth of indications observed visually between 0 degree azimuth and 41 degree lifting eye during 2R03. Results show crack to be 0.384 inches in depth. These indications were accepted by engineering evaluation.
		VT-3	VT-3 examination of overall Steam Dryer assembly. No indications identified.
	1999 (2R05)	VT-3	VT-3 examination of overall Steam Dryer assembly. Examination revealed cracking in upper support ring at 135 degree and 315 degree lifting lugs. These indications were accepted by engineering evaluation.
	2001 (2R06)	VT-1	VT-1 examination of Steam Dryer Drain Channel welds. No indications identified.
	2003 (2R07)	VT-3	VT-3 examination of overall Steam Dryer assembly. No indications identified.
		VT-1	VT-1 examination of Steam Dryer Drain Channel welds. No indications identified.
	2005 (2R08)	VT-1	VT-1 examination of Steam Dryer Drain Channel welds. VT-1 examination of

			Steam Dryer Hood Bank #1 and Bank #6 seam welds. VT-1 examination of Steam Dryer Cover Plate welds at 90 degree and 270 degree. No indications identified.
	2007 (2R09)	Best Effort VT-1	Performed Best Effort VT-1 inspections of bottom hood seam welds (SDBH 1a-b, 2a-b, 3a-b, 4a-b, 5a-b, 6a-b), end bank welds (SDEB 1a-d, 2a-d, 3a-d, 4a-d, 5a-d, 6a-d), guide bracket at 0 Az (SDGB), hood vertical seam welds (SDHS 2b-d, 3b-d, 4b-d, 5b-d), hood reinforcement welds (SDHSR 2a-d, 3a-d, 4a-d, 5a-d), welds on all four lifting rods (SDLRx 1a-c, 2a-b, 3a-b, 4a-b, CP, LE, TW), man way welds (SDMW a-d), plenum partition welds (SDPP 2a-b, 3a-b, 4a-b, 5a-b), support ring (SDSR), and tie bars (SDTB 1-5, 8-9, 17, 22-24). Minor IGSCC identified on the support ring and evaluated as acceptable. A small piece of raised metal was identified on SDTB 3 and evaluated to be acceptable. One indication approximately 1.5 inches in length was identified and evaluated as acceptable on SDHS4c weld near the intersection of the bottom of the hood seam and the horizontal joining plate. No other indications identified.
	2009 (2R10)	Best Effort VT-1	Performed Best Effort VT-1 inspections of guide bracket at 180 Az (SDGB), hood vertical seam welds (SDHS 1a-d, 2b-d, 4c), hood reinforcement welds (SDHSR 2a-d), plenum partition welds (SDPP 2a-b), top horizontal welds (SDTH 1, 6), drain channel welds (SDDC 1a-c), cover plate welds (SDCP 7a-b), and tie bars (SDTB 3, 6, 7, 10-16, 18-21, 25-37). No change noted in IGSCC identified on the support ring during the cover plate exam or on the small piece of raised metal identified on SDTB03.

			One of two tack welds was identified as cracked on the 221.5 Az. lifting rod between the lifting rod and the eye during a VT-1 examination performed for the site heavy loads program (non-BWRVIP exam). This indication was evaluated as acceptable for continued operation. One indication on SDHS4c weld near the intersection of the bottom of the hood seam and the horizontal joining plate showed minimal growth of 0.2 inches. This indication was evaluated as acceptable for another cycle of operation. No other indications identified.
	2011 (2R11)	VT-1	Performed VT-1-89 inspections of hood vertical seam welds (SDHS 2c, 3b-d, 4b-d, 5c), hood reinforcement welds (SDHSR 3a-d, 4a-d), plenum partition welds (SDPP 3a-b, 4a-b), bottom horizontal welds (SDBH 1a-b, 2a-b), drain channel welds (SDDC 2a-c), cover plate welds (SDCP 1a-b), end bank welds (SDEB 1a-d, 2a-d), support ring (SDSR), lifting rod A (SDLRA all welds), and tie bar (SDTB 3). No change noted to previous support ring indications, but two new indications identified and evaluated as acceptable. No change noted in previous tie bar indication (SDTB 3), hood seam indication (SDHS4c), or lifting rod tack weld indication (SDLRCTW). One new indication identified on hood seam (SDHS3c). Indication is 3/4 inches in length and was evaluated as acceptable. Two new indications identified on end bank welds. SDEB2a has one indication approx. 1.5 inches in length and SDEB1d has one indication approx. 3 inches in length. Both were evaluated as acceptable.

			No other indications identified.
	2013 (2R12)	VT-1	Performed VT-1-89 inspections of hood vertical seam welds (SDHS 3c, 4c, 5b-d), hood reinforcement welds (SDHSR 5a-d), plenum partition welds (SDPP 5a-b), bottom horizontal welds (SDBH 3a-b, 4a-b), drain channel welds (SDDC 3a-c), man way welds (SDMW a-d), end bank welds (SDEB 1d, 2a, 3a-d, 4a-d), lifting rod B (SDLRB all welds), lifting rod C tack weld (SDLRCTW), and tie bar (SDTB03). Two new IGSCC indications (0.53" and 0.81") identified and evaluated as acceptable in the 3a drain channel. One new IGSCC indication (0.15") identified and evaluated as acceptable in the 4b end bank weld. No change noted in previous end bank indications (SDEB1d and SDEB2a), tie bar indication (SDTB 3), hood seam indication (SDHS3c and SDHS4c), or lifting rod tack weld indication (SDLRCTW). No other indications identified.
	2015 (2R13)	VT-1	Performed VT-1-89 inspections of hood vertical seam welds (SDHS 3c, 4c, 6a-d), bottom horizontal welds (SDBH 5a-b), top horizontal weld (SDTH 6), drain channel welds (SDDC 3a, 4a-c), end bank welds (SDEB 1d, 2a, 4b, 5a-d), support ring (SDSR), steam dryer lifting rods (41.5, 138.5, 221.5, 318.5 deg), lifting rod C attachment weld (SDLRC 1a-c, 2a-b, 3a-b, 4a-b, cover plate weld, lifting eye welds), lifting rod C tack weld (SDLRCTW), and tie bar (SDTB03). Three new indications identified and evaluated as acceptable on the steam dryer support ring. No change noted in previous drain channel indications (SDDC3a), end bank indications (SDEB 1d, 2a, 4b), hood

			seam indication (SDHS3c and SDHS4c), lifting rod tack weld indication (SDLRCTW), steam dryer support ring (SDSR), tie bar (SDTB03). No other indications identified.
	2017 (2R14)	VT-1	Performed VT-1-89 inspections of hood vertical seam weld (SDHS 3c), bottom horizontal welds (SDBH 6a-b), top horizontal weld (SDTH 1), drain channel weld (SDDC 3a), end bank welds (SDEB 1d, 4b, 6a-d), upper and lower guide brackets at 0 and 180, steam dryer lifting rods (41.5, 138.5, 221.5, 318.5 deg), lifting rod D bracket welds (SDLRD 1a-c, 2a-b, 3a-b, 4a-b, cover plate weld, lifting eye welds), lifting rod D tack weld (SDLRDTW), and all 37 tie bars except SDTB03. No change noted in previous drain channel indication (SDDC3a), end bank indication (SDEB 1d and 4b), hood seam indication (SDHS3c), and the lifting rod tack weld indication (SDLRCTW). No other indications identified.
DM Welds - BWRVIP-75-A Cat. A	2007 (2R09)	UT	2 welds inspected: PDI qualified, automated exams, no flaws identified, no repairs
DM Welds - BWRVIP-75-A Cat. B	2007 (2R09)	UT	2 welds inspected with 82/182: PDI qualified, automated exams, no flaws identified, no repairs.
	2009 (2R10)	UT	2 welds inspected with 82/182: PDI qualified, manual exams, no flaws identified, no repairs.
	2011 (2R11)	UT	0 welds inspected with 82/182. 2 welds inspected without 82/182: PDI qualified, manual exams, no flaws identified, no repairs.

	2013 (2R12)	UT	3 welds inspected with 82/182 – all PDI qualified, manual exams, no flaws identified, no repairs
	2017 (2R14)	UT	1 weld inspected with 82/182 – PDI qualified manual phased array exam, no unacceptable flaws identified, no repair or replacement needed.

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	Baseline per BWRVIP-01 and reinspected per BWRVIP-07. Indications in several circumferential welds as identified below: H1 17% flawed over 307.6" total scan length. H2 1% flawed over 287.7" total scan length. H3 28% flawed over 263" total scan length. H4 6% flawed over 289.1" total scan length. H5 0% flawed over 298.4" total scan length. H6 4.5% flawed over 298.4" total scan length. H7 0% flawed over 291.7" total scan length. 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. 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.
	2005	UT and VT-1	Baseline per BWRVIP-01 and reinspected per BWRVIP-76. Indications in several circumferential welds as identified below:

			H1 75.51% Inspected, 16.21% Flawed H2 59.26% Inspected, 6.02% Flawed H3 71.56% Inspected, 27.19% Flawed H4 Upper 68.46% Inspected, 8.33% Flawed Lower 68.46% Inspected, 5.02% Flawed H5 68.46% Inspected, 0.5% Flawed H6 68.88% Inspected, 2.52% Flawed H7 68.88% Inspected, 0% Flawed V2 CW 63.3% Inspected, 0% flawed CCW 83.6% Inspected, 23.74% flawed V3 CCW 42.5% Inspected, 0% Flawed V4 EVT-1: Top 18" to H3, No indications
	2007	EVT-1	Visual inspection of the v4 and v3 from the shroud ID
	2015	UT	Weld: % Inspected, % Flawed, Max. Flaw Depth (Shroud Thickness = 1.75") H1: 68.4% Inspected, 24.9% Flawed, 0.35" H2: 66.9% Inspected, 4.8% Flawed, 0.56" H3: 78.8% Inspected, 39.9% Flawed, 0.71" H4: 70.2% Inspected, 17.2% Flawed, 0.88" H5: 69.9% Inspected, 0.7% Flawed, 0.28" H6: 60.6% Inspected, 6.4% Flawed, 0.50" H7: 66.9% Inspected, 0% Flawed, N/A V2: 59.2% Inspected, 27.6% Flawed, 0.63" V3: 56.8% Inspected, 4.9% Flawed, 0.34" V4: 46.9% Inspected, 0% Flawed, N/A

		VT-3	Shroud OD examined in the accessible areas between Jet Pump sets from the H2 weld to the shroud support plate. Shroud ID examined from cells 22-51, 30-51, 30-03. No indications identified from VT-3 inspection.
	2017	EVT-1	Shroud Vertical Welds V5 and V6 were inspected using EVT-1 from the ID only. The welds were inaccessible for inspection from the OD. No indications were identified. V5 Coverage: 95% V6 Coverage : 100%
Shroud Support	1994-1996	VT-1 & VT-3	VT of H8 and H9 from the annulus have been performed. No reportable indications to date. VT of access hole covers, performed every other outage per the IVVI program. No indications have been reported to date. 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. 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.
	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	Shroud Support Legs (14) • 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.
	2003	VT-3	Re-inspection of the 210 degree location of the shroud support leg. No change in condition.
	2005	EVT-1	H8 and H9 from 338 degree to 22 degree and 158 degree to 202 degree, NRI
		VT-3	Accessible areas of ledge for AMSE section XI, NRI
	2009	VT-3	Previously discovered indication on H10 weld at 210 degrees was examined and no change was found. However a new indication was discovered on the 200 degree side of the H10 weld at 210 degrees. This discovery prompted further inspection of H10, H11 and H12 welds on all 14 support legs. New indications were discovered on H10 welds on 12 out of 14 support legs. The legs at 90 degrees and 350 did not have any indications. The crack indications were confined to H10 welds only. All indications that could be further examined were only in the weld material and not through-wall.

	2011	VT-3	Re-examined previously recorded indications on the H10 weld at the following locations: 10°, 30°, 60°, 120°, 150°, 170°, 190°, 210°, 240°, 270°, and 300°. No change was observed in the indications. Three new indications were discovered on the H10 weld at the 90°, 330° and 350° locations. All new indications were confined to the H10 welds and did not go through wall.
		VT-3	Examined accessible areas of both top and underside of shroud support plate and H8 and H9 welds. During inspections of the previously recorded indications on the H10 welds, new relevant indications were also discovered on the H8 and H9 welds on the underside of the shroud support plate. No indications were discovered on the top side of the H8 and H9 welds or the support plate. Examined all shroud support legs at the following locations: 10°, 30°, 60°, 90°, 120°, 150°, 170°, 190°, 210°, 240°, 270°, and 300°, 330° and 350°.
		EVT-1	H8 and H9 weld at the 0 and 180 degree locations.
	2013	VT-3	Re-examined previously recorded indications on the H10 weld at the following locations: 10°, 30°, 60°, 90°, 120°, 150°, 170°, 190°, 210°, 240°, 270°, and 300°, 330°, 350°. No change was observed in the indications. One new/previously unreported relevant indication was discovered on the H10 weld at the 300° location. The new indication was contained in the weld.
		EVT-1	Re-examined topside of both the H8 and H9 weld, approximately 34% of the entire circumference. No relevant indications identified.

		VT-3	Hydrolazing and examination of the underside of the H8 weld at the 68° and 210° locations, relevant indications discovered during the previous outage confirmed. Hydrolazing and examination of the underside of the H9 weld at the 142° and 292° locations, relevant indications discovered during the previous outage confirmed. **Additional Inspection of low alloy base metal described in "Other Exams" Section**
	2015	EVT-1	Inspected all accessible areas of the top side of the H8 and H9 welds. No indications noted. Inspected both access hole covers at 0° and 180°. Four new indications were identified. Two indications were identified on the 0° access hole cover and 2 indications were identified on the 180° access hole cover. Indication lengths are listed below. All indications were accepted by evaluation. Indications (Lengths) 1: 0.79" (AHC 0°) - Axial 2: 5.50" (AHC 0°) - Circumferential 3: 0.56" (AHC 180°) – Circumferential 4: 0.28" (AHC 180°) – Circumferential
		VT-3	Inspection of all accessible areas of the underside of the H8 and H9 welds was completed. Four locations on the underside of the H8 and H9 welds mapped from the 2013 outage were re-examined. The four locations were H8: 68° and 210° locations and H9: 142° and 292° locations. There was no change to the flaws and no new relevant indications identified.
	2017	EVT-1	Inspected all accessible areas of the top side of the H8 and H9 welds. No indications noted.

			Inspected both access hole covers at 0° and 180°. The four (4) indications identified during 2015 were reinspected. No indication change or growth was identified. It was identified that Indication #2 dimensioning in 2015 to determine length did not fully capture the indication. The indication was re-dimensioned and the final indication length was determined to be 5.67in. The indication remains acceptable by evaluation. Indications (Lengths) 1: 0.79" (AHC 0°) - Axial 2: 5.67" (AHC 0°) - Circumferential 3: 0.56" (AHC 180°) – Circumferential 4: 0.28" (AHC 180°) – Circumferential
		VT-3	Inspection of all accessible areas of the underside of the H8 and H9 welds was completed. Four locations on the underside of the H8 and H9 welds mapped from the 2013 and 2015 outages were re-examined. The four locations were H8: 68° and 218° locations and H9: 142° and 292° locations. There was no change to the flaws and no new relevant indications identified. VT-3 examination the H10, H11 and H12 welds were performed on all 14 of the shroud support legs. All H10 welds had previously identified indications (10°, 30°, 60°, 90°, 120°, 150°, 170°, 190°, 210°, 240°, 270°, 300°, 330°, 350°), which did not show any change from previous exams. No relevant indications were identified on the H11 and H12 welds.
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 Flaws identified during the 1998 RFO inspection were all located at the 13.5 deg location and are listed as follows: 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" 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.
		EVT-1	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 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.
	2001	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
	2003	UT	UT of the following welds in 1998 were performed per the BWRVIP-18 guidelines: <u>13.5 deg location</u> P5, 100% coverage P6, 100% coverage <u>166.5 deg location</u> P5, 100% coverage Flaws identified during the 2003 RFO inspection were all located at the 13.5 deg location and are listed as follows: Weld/ | Start Location | Flaw # | Start End | Flaw Length P5/1 312.5 ° | 344.1° 1.53" P6/1 54.9 ° | 73.0° 0.96" P6/2 86.5 ° | 99.9° 0.71" P6/3 106.6° | 145.6° 2.06" P6/4 153.7 ° | 269.6° 6.13" P6/5 286.7 ° | 317.4° 1.62" P6/6 347.7 ° | 44.3° 2.99" NOTE: Flaws 1,2,3,6 on P6 are on the top side of the weld and flaws 4,5 on P6 are on the bottom side of the weld.
		EVT-1	An enhanced visual examination was performed on all target welds that were not UT examined. No reportable indications were identified visually.
		EVT-1	EVT-1 of P4(a-d) of "C" leg(193 Degrees). All P5, P6, P7, P8(a,b). No

			indications.
		VT	Visual inspection of core spray T-Box Repair. No change in previous indication at 90 degrees.
	2005	EVT-	EVT-1 of P4(a-d) of "D" leg(13 Degrees). All P5, P6, P7, P8(a,b) Welds. No indications.
		VT	Visual inspection of core spray T-Box Repair. No change in previous indication at 90 degrees.
	2007	EVT-1	EVT-1 of P4(a-d) of "A" leg(193 Degrees). All P5, P6, P7, P8(a,b) Welds. No indications.
		VT	Visual inspection of core spray T-Box Repair. No change in previous indication at 90 degrees.
	2009	EVT-1	P1 and P2 at 90 and 270 degrees. P3A-DP4Ba-d, P5A-D, P6A-D, P7A-D, P8Aa-b, P8Ba-b, P8Ca-b, P8Da-b. Piping brackets at 30, 150, 210 and 330.
		VT-3	Header repair clamp. Piping brackets at 30,150, 210, 330. No change to previously identified indication in header repair clamp. No new indications.
	2011	EVT-1	Examinations: P1 and P2 welds at the 90 and 270 degree locations. P3 (a thru d) at 80°, 100°, 260°, 280° locations. P5, P6, P7 and P8 (a-b) at 13°, 166°, 193°, 346° locations. No new indications. The previously recorded indication that was repaired with the repair clamp at the P3A weld at the 90° location was also examined and no change was noted.
		VT-1	The pipe clamp assemblies at the 90° and

			270° locations were also examined. No indications were observed.
	2013	EVT-1	Examinations: P1 and P2 welds at the 90° and 270° degree locations. P3 (A thru D) at the 80°, 100°, 260°, 280° locations. P5, P6, P7, P8a-b at the 13° , 166°, 193°, and 346° locations. Core Spray Piping Brackets at the 30°, 150°, 210°, and 330° locations. Previous indication on P3A. Previous indication unchanged. No new relevant indications.
		VT-1	Piping Clamp Assemblies at 90° and 270°. No relevant indications.
		VT-3	Core Spray Piping Brackets at the 30°, 150°, 210°, and 330° locations. No relevant indications,
	2015	EVT-1	P1, P2 at 90° and 270° P3 (A thru D) at 80°, 100°, 260°, and 280° P4 (A thru D) at 349° P5, P6, P7, P8a, and P8b at 13°, 166°, 193° and 346° Previous indication on P3A unchanged. No new relevant indications.
		VT-1	Piping Repair Clamp Assemblies at 90° and 270°. No relevant indications.
	2017	EVT-1	P1, P2 at 90° P3A at 80° P3B at 100° P4 (A thru D) at 166° P5 at 13° and at 166° P6 at 13° and at 166° P7 at 13° and at 166° P8a and P8b at 13° and at 166° Core Spray Piping Bracket Tack Welds and Bracket to Vessel Attachment Weld at 30° P3A indication remains unchanged. No new indications identified.

		VT-3	Tee Box Clamps at 90° and 270°. Core Spray Piping Bracket at 30° – General Condition No new indications identified.
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 • 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 indications.
		VT-1	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.
	2003	EVT-1	Upper S4-1@272°, Upper S2-1@344°, Upper S1@346°, Upper S2-2@348°, Upper S4-2@87°, Lower S4-1@272°, Lower S2-1@11°, Lower S1@ 13°, Lower S2-2@15°, Lower S4-2@ 87°: No indications found.

		VT-1	Upper & lower S3(a&b) from 272° to 87°, Upper & lower S3c-1 &-2, 272° SB, 306° SB, 346° SB, 13° SB, 54° SB, 87° SB: No indications
	2005	EVT-1	Upper S4-2@267°, Upper S2-2@195°, Upper S1@193°, Upper S2-1@191°, Upper S4-1@93°, Lower S4-2@267°, Lower S2-2@168°, Lower S1@ 166°, Lower S2-1@164°, Lower S4-1@ 93° :No indications found.
		VT-1	Upper & lower S3(a&b) from 93° to 267°, Upper & lower S3c-1 &-2, 93° to 267 degree 93° SB, 126° SB, 166° SB, 193° SB, 234° SB, 267° SB: No indications
	2007	EVT-1	Upper S4-1@272°, Upper S2-1@344°, Upper S1@346°, Upper S2-2@348°, Upper S4-2@87°, Lower S4-1@272°, Lower S2-1@11°, Lower S1@ 13°, Lower S2-2@15°, Lower S4-2@ 87° :No indications found.
		VT-1	Upper & lower S3(a&b) from 272° to 87°, Upper & lower S3c-1 &-2, 272° SB, 306° SB, 346° SB, 13° SB, 54° SB, 87° SB: No indications
	2009	EVT-1	S1B, S1C, S2B1, S2B2, S2C1, S2C2, S4B1, S4B2, S4C1, and S4C2 welds.
		VT-1	BS3C-1, BS3C-2, BS3A, BS3B, CS3C-1, CS3C-2, CS3A and CSB Core Spray Sparger Brackets at 93, 126, 166, 193, 234 and 267 degrees. No indications found.
	2011	EVT-1	Examinations: S1A & D at 13° and 346°, S2A-1 & 2 at 11° and 15°. S2D-1 & 2 at

			344° and 348°. S4A-1 & 2 and S4D-1 & 2 at 87° and 272°. No indications.
		VT-1	Examinations: AS3A & B and DS3A & B at 87° and 272° locations. AS3C-1 & AS3C-2 sparger drain plug welds. Upper and lower sparger brackets at 13°, 54°, 87°, 272°, 306°, 346° locations. No indications.
	2013	EVT-1	Examinations: S1 (A thru D) at the 13° , 166°, 193°, and 346° locations. S2-1 and S2-2 (A thru D) at the 13° , 166°, 193°, and 346° locations. S4-1 and S4-2 (A thru D) at the 87°, 92°, 267° and 272° locations. No relevant indications.
		VT-1	Examinations: AS3A & B from 272° to 87°. BS3A & B from 92° to 267°. CS3A & B from 92° to 267°. DS3A & B from 272° to 87°. AS3C-1 &2, BS3C-1 &2, CS3C-1 &2 and DS3C-1 &2. Upper and lower sparger brackets at 13°, 54°, 87°, 93°, 126°, 166°, 193°, 234°, 267°, 272°, 306°, 346° locations. No relevant indications.
	2015	VT-1	Sparger Brackets: 13°, 54°, 87°, 272°, 306° and 346°. AS3A & B from 272° to 87°. DS3A & B from 272° to 87°. AS3C-1 &2 at 55° and 305° DS3C-1 &2 at 55° and 305°
		EVT-1	S1A at 13° S1D at 346° S2A-1 at 11° and S2A-2 at 15°, S2D-1 at 344° and S2D-2 at 348° S4A-1 at 87°, S4A-2 at 272° S4D-1 at 87°, S4D-2 at 272° No relevant indications.

	2017	EVT-1	S1-B at 166° S2-B-1 at 164° S2-B-2 at 168° S4-B-1 at 92° S4-B-2 at 268°
		VT-1	Sparger Brackets: 126° and 166°
		VT-3	BS3A and BS3B from 268° to 92° BS3C-1 at 126° BS3C-2 at 234° No relevant 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
	2003	VT-1	Top Guide Aligner Pin and Socket Assemblies (252° and 341°): No indications Top Guide Hold Down Latches (18° & 198°): No Indications

	2007	VT-1	Top Guide Aligner Pin and Socket Assemblies (72° and 162°): No indications
	2009	VT-1	Top Guide Grid Beams (B-N-1): 06-19, 06-27, 06-35, 10-11, 10-43, 14-11, 14-15, 14-19, 14-35, 18-07, 18-31,18-43, 22-03, 22-07, 22-11, 22-23, 22-31,22-43, 26-03, 26-11, 26-47, 30-23, 30-31, 34-07, 34-15, 34-39, 34-4, 38-11, 38-15, 42-11, 42-15, 14-07, 38-07 Top Guide Perimeter 360 degrees around No indications found.
	2011	EVT-1 & VT-3	Examinations of Top Guide cells: 38-07,34-35, 34-19, 30-39, 18-35, 18-19, 14-11, 14-07. No indications.
		VT-1	Examinations: Top Guide Aligner Pins and Sockets at 72° and 162°. No indications.
		VT-3	Examination of Top Guide accessible areas. No indications.
	2015	EVT-1 & VT-3	Examinations of Top Guide cells: 38-07,34-35, 34-19, 30-39, 18-35, 18-19, 14-11, 14-07. No indications.
		VT-1	Examinations: Top Guide Aligner Pins and Sockets at 72° and 162°. No indications.
		VT-3	Examination of Top Guide accessible areas. No indications.
	2017	EVT-1	Top Guide Grid Beam Exams at Cell Locations: 10-35, 26-31, 26-23, 42-19. No relevant indications.

Core Plate (Rim, etc.)	N/A	N/A	N/A
	2009		Tops of accessible fuel support channels. Core Plate (B-N-1, B-N-2): 06-19, 06-27, 06-35, 10-11, 10-43, 14-11, 14-15, 14-19, 14-35, 18-07, 18-31, 18-43, 22-03, 22-07, 22-11, 22-23, 22-31, 22-43, 26-03, 26-11, 26-47, 30-23, 30-31, 34-07, 34-15, 34-39, 34-47, 38-11, 38-15, 42-11,42-15, 14-07, 38-07 No indications found.
	2011	VT-3	Examinations of accessible areas in cell locations 38-07,34-35, 34-19, 30-39, 18-35, 18-19, 14-11, and 14-07. No indications.
	2013	VT-3	All accessible areas. No relevant indications.
	2015	VT-3	Accessible areas of accessible locations 34-31, 30-47, 18-31, 22-51, 18-23, 06-23, 34-23 and 30-03.
		EVT-1	Inspection of fuel support casting at 34-31, 30-47, 18-31, 22-51, 18-23, 06-23, 34-23 and 30-03 cell locations. No relevant indications.
	2017	EVT-1	Fuel Support Castings: 42-11, 38-15, 26-31, 26-23. No relevant indications.
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.

	2003 2005 2007 2009 2011	EVT-2 EVT-2 EVT-2 EVT-2 EVT-2	No Indications No Indications No indications No indications No indications
Jet Pump Assembly- 20 Assemblies	1993-1996	VT-1	VT-1 of the following components performed every refueling outage for each jet pump: 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. 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. A preemptive repair of the jet pump hold-down beams was performed during the 1982 refueling outage. 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.
	1998	EVT	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. The following flaws were identified as a result of the IVVI exam: JP-14, Beam Bolt Retainer Tack Weld crack like indication. JP-18, Crack like indication on upper leaf to yoke weld. JP-19, Beam Bolt Retainer Tack Weld crack like indication.
		UT	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.
	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	Bracket to Diffuser Welds • 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. The examinations performed also reconfirmed previously recorded and unrepaired relevant indications in the following reactor vessel internal components: • 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) Due to enhanced inspection and measurement techniques, evaluation of the previously recorded indications on the following components has changed since the RF18 Refueling Outage: 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.
	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 VT-1	RB-1 pumps 11-18 and 20 RB-1 pumps 1-10 and 19
		EVT-1 VT-1	RB-2 pumps 11-18 and 20 RB-2 pumps 1-10 and 19
		EVT-1 VT-1	RS-8 to RS-11 pumps 11-18 and 20 RS-8 to RS-11 pumps 1-10 and 19

		VT-1	Restrainer bracket , Set Screws, and welds (Including gaps)
	2003	EVT-1	JP#1 (MX-1, MX-2, MX-4) JP#2 (MX-1, MX-2, MX-4) JP#3 (MX-1, MX-2, MX-4) JP#4 (MX-1, MX-2, MX-4) JP#5 (MX-1, MX-2, MX-4) Riser@30° (RS-1, RS-2, RS-3) Riser@240° (RS-1, RS-2, RS-3) Riser@330° (RS-1, RS-2, RS-3) JP#19 (RB-4d): No New Indications Transition region of all beams inspectedEVT-1 no cleaning: No Indications
		VT-1	JP#20 (WD-1), JP#19 (WD-1), JP#10 (WD-1): No Indications
	2005	VT	JP#6 (MX-1, MX-2, MX-4) JP#7 (MX-1, MX-2, MX-4) JP#8 (MX-1, MX-2, MX-4) JP#9 (MX-1, MX-2, MX-4) JP#10 (MX-1, MX-2, MX-4) Riser@30° (RS-4, RS-5) Riser@60° (RS-4, RS-5) Riser@90° (RS-4, RS-5) Riser@150° (RS-4, RS-5) Riser@210° (RS-1, RS-2, RS-3) Riser@270° (RS-1, RS-2, RS-3) No Indications
	2007	UT	BB-1, BB-2 and BB-3 of all 20 Holddown Beams
	2009	EVT-1	JP#11 (MX-1, MX-2, MX-4) JP#12 (MX-1, MX-2, MX-4) JP#13 (MX-1, MX-2, MX-4) JP#14 (MX-1, MX-2, MX-4) Riser@30 degrees (RS-1, RS-2, RS-3) Riser@60 degrees (RS-1, RS-2, RS-3) Riser@90 degrees (RS-1, RS-2, RS-3) Riser@210 degrees (RS-4, RS-5)

			Riser@240 degrees (RS-4, RS-5) No indications found.
	2011	EVT-1	JP# 1 thru 20: RS-8, RS-9, RS-10, RS -11 JP# 6 thru 10: RS-1, RS-2, RS-3 JP# 14 thru 20: RS-4 and RS-5 JP# 15 thru 20: MX-1, MX-2 and MX-4 No indications.
		VT-1	JP# 1 thru 20: riser brace to pad attachment welds and WD-1. No indications.
	2013	EVT-1	JP# 15 thru 20: RS-1, RS-2, RS-3 JP#3 & 4 : RS-4, RS-5, RS-8, RS-9, RS-10, RS-11 JP#1 thru 4: MX-1, MX-2, MX-4, IN-5 JP#1 thru 4: RB-1, RB-2 No relevant indications.
		VT-1	JP#3 & 4 WD-1 No relevant indications.
		UT	All 20 Jet Pump Beams, BB-1, BB-2, BB-3. No relevant indications.
	2015	EVT-1	Inspection of the JP 7-8 Riser Brace leg to vessel pad weld flaw – No change to indication Inspection of the JP 19-20 Riser Brace leg to vessel pad weld flaw – No change to indication.
	2017	EVT-1	JP 1 thru 20 (ALL): RS-8 and RS-9 JP 1/2: RS-4, RS-5, RS-10, RS-11 JP 5/6: RB-1, RB-2, RS-4, RS-5, RS-10, RS-11 JP 5: MX-1, MX-2, MX-4 JP 6: MX-1, MX-2, MX-4 JP 11/12: RS-1, RS-2, RS-3 JP 13/14: RS-1, RS-2, RS-3 No relevant indications.

		VT-1	JP 1 thru 20 (All): WD-1, Sensing Lines. New relevant indication identified on the JP 10 restrainer bracket to wedge interface. Indication is acceptable by evaluation.
		VT-3	JP-5: IN-5 JP-6: IN-5 No relevant indications.
Jet Pump Diffuser	1996	VT-1	Perform VT-1 inspection per the IVVI program each refueling outage. No indications have been identified to date.
	1998	UT	The following Jet Pump Diffuser welds were UT examined from the ID per the BWRVIP-41 guidelines: 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
		EVT-1	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.

	2003	EVT-1	JP#1 (DF-1, DF-2, AD-3a, AD-2) JP#2 (DF-1, DF-2, AD-3a, AD-2) JP#3 (DF-1, DF-2, AD-3a, AD-2) JP#4 (DF-1, DF-2, AD-3a, AD-2) JP#5 (DF-1, DF-2, AD-3a, AD-2)
	2005	EVT-1	JP#6 (DF-1, DF-2, AD-3a, AD-2) JP#7 (DF-1, DF-2, AD-3a, AD-2) JP#8 (DF-1) JP#9 (DF-1, DF-2, AD-3a, AD-2) JP#10 (DF-1, DF-2, AD-3a, AD-2) JP#20 (DF-2)
	2007	VT-1	Wedge Inspection (JP 11-20) AD-1 (JP 1-20)
	2009	EVT-1	JP#11 (DF-1, DF-2, AD-3a, AD-2) JP#12 (DF-1, DF-2, AD-3a, AD-2) JP#13 (DF-1, DF-2, AD-3a, AD-2) JP#14 (DF-1, DF-2, AD-3a, AD-2) JP#15 (DF-1, DF-2, AD-3a, AD-2)
	2011	EVT-1	P# 16 thru 20: DF-1, DF-2, AD-2, AD-3a, AD-3b. No indications.
	2013	EVT-1	JP#1 thru 5: DF-1. JP#1 thru 6: DF-2, AD-1, AD-2, AD-3a, AD-3b. No relevant indications.
	2017	EVT-1	JP 7: DF-2, AD-3a, AD-1, AD-2 JP 8: DF-2, AD-3a, AD-1, AD-2 JP 9: DF-2, AD-3a, AD-1, AD-2 JP10: DF-2, AD-3a, AD-1, AD-2
CRD Guide Tube	2003	VT-3	CRGT-1(30-11, 26-11, 26-27, 26-07, 30-07, 10-15) ARPIN-1(30-11, 26-11, 26-27, 26-07, 30-07, 10-15)
		EVT-1	CRGT-2(30-11, 26-11, 26-27, 26-07, 30-07, 10-15) CRGT-3(30-11, 26-11, 26-27, 26-07, 30-07, 10-15)

	2005	VT-3	CRGT-1(22-27, 22-47, 26-27, 26-47, 30-47, 34-19, 34-35, 34-43, 46-27, 2-31, 18-19, 18-35, 18-47, 22-43) ARPIN-(22-27, 22-47, 26-27, 26-47, 30-47, 34-19, 34-35, 34-43, 46-27, 2-31, 18-19, 18-35, 18-47, 22-43)
		EVT-1	CRGT-2(22-27) CRGT-3(22-27)
	2009	EVT-1	CRGT-2 (10-11, 14-15, 18-07, 22-23, 22-31, 30-23) CRGT-3 (10-11, 14-15, 18-07, 22-23, 22-31)
		VT-3	CRGT-1 (10-11, 14-15, 18-07, 22-23, 22-31, 30-23)
	2011	VT-3	ARPIN (10-11, 18-07, 22-23, 22-31, 30-23, 38-15, 30-31, 34-07, 34-15, 42-11) Examinations of guide tubes in cell locations 38-07,34-35, 34-19, 30-39, 18-35, 18-19, 14-11, 14-07. No indications.
	2013	VT-3	Examinations of guide tubes in cell locations 06-31, 06-35, 10-43, 18-15, 18-27, 22-03, .22-11, 22-51, 26-03, 26-19, 26-35, 30-03, 34-27, 38-11, 38-39, 42-15, 42-43. No relevant indications.
	2015	VT-3	Examinations of guide tubes in cell locations 34-31, 30-47, 18-31, 22-51, 18-23, 06-23, 34-23 and 30-03. No relevant indications.
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	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.
	2011	VT-1	Examinations of spring and upper 2 feet of the following: IRMs at core locations 20-33, 28-23, 20-41, 12-41, 36-41, 12-09, 28-25, 20-25. SRMs at core locations 12-25, 28-17, 36-09, 36-33. No indications.
	2013	N/A	Last 5 original pre-1986 style dry tubes replaced with newer, IGSCC resistant post-1986 style dry tubes.
	2015	VT-1	Inspection of the spring and upper 2 feet of the following: IRM 12-09, 12-41, 20-25, 28-25, and 36-41, SRMs: 12-25, 20-41 and 36-33. No relevant indications.
Instrument Penetrations		VT-1	Visual inspection of the instrument lines 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. In 2005, one surveillance bracket (empty) was identified as bent, no further action.
	2011	VT-1	Surveillance Sample Holder Lower Brackets at 30°, 120° and 300°. Guide rod vessel attachment welds at 175° and 355°. No indications.
		VT-3	Examinations: Feedwater sparger end brackets and attachment welds at 0°, 90°, 180°, 270° locations. Surveillance Sample Holder Upper Brackets at 30°, 120° and 300°. Surveillance sample holder at 120°. Guide Rod brackets at 175° and 355°. Steam Dryer support bracket and weld at 35°, 145°, 215°, 325°. Indication was discovered on guide rod at 175°.
	2015	VT-3	Inspection of bent upper surveillance sample holder bracket (empty) at 30° - No

			change. Inspection of surveillance sample holder and brackets at 120°.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	2005	VT	Performed OD visual inspection of all accessible welds. Three indications found behind the lifting lugs. Each approximately 1-1/2 inches long. One indication found in the support block guide channel to skirt weld (~0.75 inches long).
	2007	VT	Dryer ID inspection. Found a IGSCC in the weld surrounding a square drain channel access panel. Reinspected OD welds with indications. No reportable change.
	2009	VT-1	Previous Dryer OD Indication: V3 @ 90°, V10 @ 90°, V10 @ 270°, Jacking Bolt @ 325°, Vertical Guide @ 215° Previous Dryer ID Indication: DC-F Cover Plate @ 0 degrees
		VT-3	Steam Dryer Hold Down Brackets @ 35°, 145°, 215°, 325° No changes in previous indications. No new indications.
	2011	N/A	Monticello replaced the OEM steam dryer with a Westinghouse Nordic style steam dryer.
	2013	VT-1	Outer Hood, Cover Plate, Lifting Rod Brackets with support ring, Lifting Rod Bracket Welds, Lifting Rod Welds. No relevant indications.
		VT-3	Support Ring Lower Surface. No relevant indications.

	2017	VT-1	125 weld locations were inspected on the steam dryer using VT-1(89) in accordance with the manufacturer recommended inspection plan and station commitments. No relevant indications were identified. The interior and exterior of the steam dryer received a VT-3 to determine the general condition of the dryer. The earthquake brackets, leveling screws and vessel support lug interface for the steam dryer also received a VT-3 inspection. No relevant indications were identified.
Dissimilar Metal Welds	2009	None	No BWRVIP-75 DM weld exams were performed during the 2009 RFO.
Other Exams	2011	UT	Performed UT inspection of the low alloy base metal of the reactor vessel in order to obtain additional information on the nature of cracking observed from the relevant indications on the H9 weld. There is no evidence of cracking that the visual indications identified in the bottom side of the H9 weld extend into the low alloy base metal of the reactor vessel.
	2013	UT	UT of approximately 57.5" of the RPV LAS adjacent to H9 from the RPV OD at N-1A recirculation outlet nozzle window (axial scan looking for circumferential flaws) was performed , but not considered a BWRVIP exam as it was not performed IAW BWRVIP-104 requirements. No credit was taken for UT of the H9 weld. The purpose of the examination was to interrogate the base metal near H9 to determine if there was evidence that the visual indications found on the underside of the H9 weld were growing into the base metal. The examination utilized PDI qualified procedures and personnel. The exams did not find any indication of flaws growing into the base metal.

	2017	VT-1	EPU Exams: FW Sparger Bracket and Pin for FW Spargers (8 total) A thru D (A: 5°, 85°; B: 95°,175°; C: 185°, 265°, D; 275°, 355°) – No relevant indications. Steam Separator Top Support Ring Gusset (4 locations) Steam Separator Mid Support Ring Gusset (4 locations) Standpipe to Shroud Head Weld (13 locations) - No relevant indications. FW Sparger A, B,C, D (A: 5°- 85°; B: 95° -175°; C: 185°- 265°, D; 275°- 355°) No relevant indications.

Reactor Internals Inspection History

Plant: **Nine Mile Point Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud & Shroud Repairs	3/17	VT-3/ EVT-1	Inspected all 4 core shroud tie rods for lower wedge/latch deflection, wedge raised at two locations per normal maintenance procedure.
		EVT-1	Performed examinations to identify and characterize atypical cracking often referred to as off-axis indications. Sample areas on H1, H2, H4, H5, H6A, V3, V7, V10 and V12.
	4/15	VT-1/ EVT-1	Inspected all 4 core shroud tie rods for lower wedge/latch deflection, wedge raised at two locations per normal maintenance procedure. No shroud inspections performed.
	5/13	VT-1/ EVT-1	Inspected all 4 core shroud tie rods for lower wedge/latch deflection. Inspection resulted in raising each wedge and pre-emptive replacement of 1 lower wedge latch. No shroud inspections performed.
	4/11	VT-1/VT-3	Shroud repair clamps at V9 and V10 – No indications noted
	4/09	EVT-1	EVT-1 on four ring segment welds V1, V2, V5 and V6. No indications noted.
		UT	UT on Ten vertical welds with no significant change as compared to previous data.
		EVT-1/ VT-3	Performed a detailed inspection on all four tie rods. Addressed lack of contact at tie rod lower spring clevis pin to lower

			support hook locations.
	3/07	EVT-1	Replaced tie rod upper supports and nuts. Performed EVT-1 of high stress locations. No Indications noted. No shroud inspections performed.
	3/05		No shroud inspections performed.
	3/03	EVT-1	Weld H4 (adjacent to V7) was visually examined to confirm previously identified UT indications. No change noted as compared to UT data for location.
	3/03		Tie rod inspection resulted in having to re-position 2 tie rods due to wedge movement.
	3/01	EVT-1	V-4 ID only (no indications noted).
	3/01	VT-3 EVT-1	Inspections performed on all 4 tie rods and V9 & V10 repair clamps.
	1999	UT	Completed repair of V9 & V10 based on UT results showing crack growth. All vertical welds were located and examined (including ring segments) using UT.
	95-97	EVT and UT	Tie rod repair (for BWRVIP) for horizontal welds H1-H7. EVT on I.D. of certain vert weld locations. No indications on vert welds (1995). 1997 (per BWRVIP) re-inspection of 2 vert welds found extensive flaws. Inspection scope expanded to include all accessible vert welds and some horizontal welds. Flaws found at several locations. Structural re-analysis performed (per BWRVIP) shroud expected to be acceptable with tie rod repair.
Shroud Support	3/17	N/A	No examination s performed.
	4/15	N/A	No examinations performed.
	5/13	N/A	No examinations performed.
	4/11	UT	Examined 100% of the accessible weld length on H8 & H9. Coverage achieved

			equivalent to 2001 baseline UT (80%). Evaluated previous indications for change with no significant change noted after comparison of difference in UT methods.
	4/09	N/A	No examinations performed.
	3/07	VT-3	Examined 100% of the accessible weld length on H8 & H9. No indications noted (ASME section XI code inspection).
	3/05	UT	H9 weld ultrasonically examined from the OD utilizing a crawler for a total length of 85".
	3/03	UT	H9 weld ultrasonically examined from the OD utilizing an OD crawler. Approximately 45" was examined to confirm no propagation into low alloy steel. No indications noted in low alloy steel.
	3/01	UT	H8 (conical ring to shroud) 80% of weld completed one sided coverage. 3 indications noted. H9 (conical ring to vessel) 80% of weld completed from ID, one sided coverage. 34 indications noted.
	1999	EVT-1	H8 & H9 100% EVT-1 examined. No change in previous indications.
	95-97	EVT and UT	1996 H8 inspected by EVT and UT, minor indications noted full structural margin. H9 EVT at 4 locations no indication. 1997 H8 re-inspected with increased scope. Previous indications no change. One new indication found by EVT in previously uninspected area. Full structural margin. H9 re-inspected EVT at one location, no indications noted.
Core Spray Piping	3/17	EVT-1	Implemented BWRVIP-18, Rev 2. Examined 20 target welds - No indications noted.

	4/15	EVT-1	Examined 19 target welds - No indications noted. Examined 1 annulus pipe support bracket attached to the shroud - No indications noted
	5/13	EVT-1	Examined 8 target welds – No indications noted. Examined one annulus pipe support bracket attached to the shroud.
	4/11	UT	Eight (8) piping welds (P5,P,6,P7 and P8) were ultrasonically examined using same methods as deployed in 2003, no indications noted. UT confirmed the visual indication from 2009 as non relevant scratch / rub mark. Subsequent additional cleaning and visual confirmed no indication.
		EVT-1	Target welds (18) utilizing EVT-1. No indications noted
		EVT-1	Examined one annulus pipe support bracket attached to the shroud.
	4/09	EVT-1	Target welds and 25% sample plan implemented utilizing EVT-1. Relevant indication noted on P6-U3A weld. Dispositioned indication as a scratch and applied BWRVIP-18 evaluation guidance to demonstrate structural integrity for one cycle. UT planned for next outage to confirm a scratch.
		EVT-1	Examined one annulus pipe support bracket attached to the shroud.
	3/07	EVT-1	Target welds and 25% sample plan implemented utilizing EVT-1. No indications noted.
		EVT-1	Examined one annulus pipe support

			bracket attached to the shroud. A 1.5 inch linear indication was found in the shroud support ring above the pipe support bracket.
		EVT-1	EVT-1 of P4-a access limited to single sided access and limited to less than 10% circumference. Considered a partially hidden weld.
	3/05	EVT-1	Target welds and 25% sample plan implemented utilizing EVT-1. No indications noted.
	3/03	EVT-1	Target welds and 25% sample plan implemented utilizing EVT-1.
	3/03	UT	3 - P8 welds (shroud side only) and both sets of slip joints (P5, 6, & 7) were examined ultrasonically. No indications noted.
	3/01	EVT-1	Re-inspection per BWRVIP-18.
	1980's to present	EVT-1	IEB 80-13 of piping and welds in annulus. No indications noted. EVT per BWRVIP-18 in 1997. No indications noted. 1999 examined target welds and 25 % sample.
Core Spray Sparger	3/17	EVT-1	Implemented BWRVIP-18, Rev. 2. Examined 3 previously identified indications on "A" sparger nozzles. No change from previous inspections.
		VT-3	Examination of S3a and S3b welds on Core Spray Spargers A and B. NRI.
	4/15	EVT-1	Examined 3 previously identified indications on "A" sparger nozzles. No change from previous inspections.
	5/13	EVT-1	Examined "A through D" Sparger T-box welds, end caps, support brackets, nozzles and 3 previously identified indications on "A" sparger nozzles. No change from previous inspections.

	4/11	EVT-1	Examined 3 Sparger T Box welds and 3 previously identified indications, no change from previous inspections.
	4/09	EVT-1/ VT-1	Examined "A through D" Sparger T-box welds, end caps, support brackets, nozzles and welds and 3 previously identified indications on "A" sparger nozzles. No change from previous inspections.
	3/07	EVT-1	Examined 3 previously identified indications on "A" sparger nozzles. No change from previous inspections.
	3/05	EVT-1	Examined 100% of spargers and 3 previously identified indications, no change from previous inspections.
	3/03	EVT-1	Examined lower sparger brackets and 3 previously identified indications, no change from previous inspections.
	3/01	EVT-1	No growth noted on 2 previous indications being monitored.
	3/99	CVT-1	1999 examined target welds and 25% sample.
	1980's to 1997	VT-1	IEB 80-13 of piping and welds on spargers. Two indications found, analyzed, and re-inspected. No repairs needed. Inspected to BWRVIP-18 in 1997. No new indications found.
Top Guide (Rim, etc.)	3/17	UT	Performed UT reinspection of the two newly identified indications from the 2015 inspection. No significant change noted.
	4/15	UT	Performed license renewal commitment 10 year UT inspection of 100% accessible top guide locations using same UT method as 2005 baseline inspection. The UT identified no significant change in the 2005 baseline non-geometric indications (79 total). The 2015 UT identified two additional indications associated with two separate bottom notch locations. One

			indication was evident in the 2005 data at 1.3" in length but was not identified, the 2015 inspection showed no change. The second indication is also associated with a bottom notch location, has a length of 0.9", this location appears to have changed from the 2005 data which showed low amplitude signal below the sizing threshold. Examined 2 Top Guide Hold Down Devices – No indications noted
	5/13	EVT-1	Examined 7 Top Guide cell locations in accordance with VIP-183. All locations have previously identified UT indications, 3 indications in grid beams and 4 in the slot area. Grid beam indications were visually observed and measured with no significant change. The slot indications were not seen visually.
	4/11	EVT-1	Examined 2 previously identified indications in Top Guide grid beams. No significant change from previous inspection results.
		VT-1	Examined 2 Top Guide Hold Down Devices – No indications noted
	4/09	EVT-1	Examined 3 previously identified indications in Top Guide grid beams. No significant change from previous inspection results.
	3/07	EVT-1	Examined 1 previously identified indication in Top Guide Grid Beam #33. No change from previous inspection.
		VT-1	VT-1 of 2 top guide hold downs (upper and lower). No indications noted.
	3/05	UT	A total of 79 non-geometric indications identified, 13 associated with attachment welds adjoining the ribs , 60 indications associated with assembly slots generally <

			1/2" and 6 indications on the grid beam bottom mid span sized at <2.5" in length.
	3/03	EVT-1	Examined 8 top guide grid beam cell locations based on SIL-554. One crack identified 1.375" long through beam thickness.
	3/01	N/A	No inspections performed.
	1993 to present	VT-1	1999 VT-1 of 2 top guide hold downs. No indications. 1993 VT-1 of selected locations on underside at mid-span locations. No indications noted. VT-1, 1995, from underside to confirm lateral spacers in place.
Core Plate (Rim, etc.)	3/17	N/A	No examinations performed.
	4/15	N/A	No examinations performed.
	5/13	N/A	No examinations performed.
	4/11	VT-3	100% of the accessible core plate surface and core plate bolts from the top surface. No indications noted
		VT-1	Examined 2 Fuel Support Piece Castings – no indications noted
	4/09	VT-3	Inspected 16 core plate bolts from the top surface. No indications noted.
	3/07	N/A	No inspections performed.
	3/05	N/A	No inspections performed..
	3/01	N/A	No inspections performed.
	1995	VT-1	1995 hold down bolts from top side. No indications.
SLC	3/17	VT-2	Normal ASME VT-2. No leakage noted.
	4/15	VT-2	Normal ASME VT-2, eliminated EVT-2

			based on credit for PDI Appendix VIII qualified UT.
	5/13	EVT-2	Enhanced visual performed with insulation removed. No leakage noted.
	4/11	EVT-2	Enhanced visual in accordance with BWRVIP-27-A.
	4/09	UT	UT of N12 safe-end to nozzle weld and accessible portions of adjacent base metal using PDI qualified technique. No indications found.
	5/99	UT	UT of N12 safe-end to nozzle weld and accessible portions of adjacent base metal using PDI qualified technique. No indications found.
	1995 to present	EVT-2	Enhanced visual in accordance with BWRVIP-27-A.
	1970's to Present	VT-2	Section XI performed each refueling.
CRD Flow Shield	3/17	N/A	No examinations performed.
	4/15	N/A	No examinations performed.
	5/13	EVT-1	Examined the CRD return line flow shield-to-thermal sleeve weld. No indications noted.
	4/11	N/A	No examinations performed.
	4/09	N/A	No examinations performed.
	3/07	EVT-1	Examined the CRD return line flow shield-to-thermal sleeve weld. No indications noted.
Jet Pump Assembly	N/A	N/A	Not applicable to this plant.
Jet Pump Diffuser	N/A	N/A	Not applicable to this plant.
CRD Guide Tube	3/17	VT-3	Reinspected alignment pin 22-23 – No change.

	4/15	EVT-1/ VT-3	Examined 2 available locations – No indications noted. Reinspected loose alignment pin for 22-23 – No change.
	5/13	EVT-1/ VT-3	Examined 3 available locations. No indications noted.
	4/11	EVT-1/ VT-3	Examined 2 available locations – No indications noted.
	4/09	N/A	No examinations performed, however during control blade change out a loose OFS/CGRT alignment pin was identified during installation of the OFS.
	3/07	EVT-1/ VT-3	Examined 2 available locations. No indications noted.
	3/05	EVT-1	2 guide tubes were removed from core plate to facilitate lower plenum inspections, was able to examine both from the OD. No indications noted.
	3/03	EVT-1	Examined 2 available locations. No indications noted.
	3/01	EVT-1	4 guide tubes made accessible for inspection.
	1997	EVT-1	1997 commenced inspection of select guide tube. 3 guide tubes examined. No indications.
CRD Stub Tube	3/17	N/A	No examinations performed
	4/15	N/A	No examinations performed
	5/13	N/A	No examinations performed
	4/11	N/A	No examinations performed
	4/09	EVT-1	Examined accessible portions of lower plenum during bottom head drain foreign material inspection. Areas such as the stub tube to RPV weld, CRD housing, CRD housing to stub tube weld, bottom head cladding and ICH (see below) were

			examined. Indications noted in the stub tube base metal at two core locations.
	3/05	EVT-1	Completed VT-3 / VT-1 on a portion of the lower plenum, no new flaws were identified.
		UT	3 stub tube J-weld areas examined. Augmented UT exams performed each outage at different locations in support of roll repair program.
	3/03	UT	2 stub tube J-weld areas examined. Preemptive UT exams performed each outage at different locations.
	3/01	UT	2 stub tube J-weld areas examined. Preemptive UT exams performed each outage at different locations.
	1984-1997	VT-2 and UT	Stub tube leakage found periodically since 1984. Condition corrected by roll repair. UT inspection before and after each repair. Pre-emptive inspection and rolling commenced in 1997 on selected stub tubes.
In-Core Housing	3/17	N/A	No examinations performed.
	4/15	N/A	No examinations performed.
	5/13	N/A	No examinations performed.
	4/11	N/A	No examinations performed.
	4/09	EVT-1 VT-1/VT-3	Examined accessible portions of incore housing guide tube weld, RPV weld, cap to tube weld, support hardware, clamps and tack welds at 2 core locations. No indications noted.
	3/05	VT-3	Inspections obtained on 2 housing.
Dry Tube	3/17	EVT-1	The upper 2 feet of six dry tubes was inspected with no signes of IGSCC. Plunger tips at these locations show signs of relaxation. Partial engagement is evident at all six inspected locations.

			Replaced 2 IRM Dry Tubes and 1 SRM Dry Tube.
	4/15	EVT-1	Examined 3 dry tubes. No indications noted. Plunger tips at the 3 locations show signs of relaxation, partial engagement evident.
	5/13	EVT-1	Examined 3 dry tubes. No indications noted. Replaced 2 Wide Range Dry Tubes spares – no inspections performed.
	4/11	EVT-1	Examined 5 dry tubes. No indications noted.
	4/09	EVT-1	Examined 3 dry tubes. No indications noted.
	3/07	EVT-1	Examined 9 dry tubes. No indications noted.
	3/05	EVT-1	3 dry tubes examined, no indications noted.
	3/03	N/A	No inspections performed.
Instrument Penetrations	3/17	VT-2	Performed VT-2 exam on all instrument penetration nozzles. No leakage noted.
	4/15	VT-2	Performed VT-2 exam on all instrument penetration nozzles. No leakage noted.
		EVT-1	Enhanced visual EVT-2 on 1 instrument penetration nozzle (N13A) with insulation removed per OPEX review. No leakage noted.
	5/13	VT-2	Performed VT-2 exam on 8 instrument penetration nozzles. No leakage noted.
		EVT-2	Enhanced visual EVT-2 on 2 instrument penetration nozzles with insulation removed. No leakage noted.

	4/11	VT-2	Performed VT-2 exam on all instrument penetration nozzles. No leakage noted.
	4/09	VT-2	Performed VT-2 exam on all instrument penetration nozzles. No leakage noted.
	3/07	VT-2	Performed EVT-2 exam on all instrument penetration nozzles. Inspections performed satisfactorily.
	3/05	VT-2	Performed EVT-2 exam on all instrument penetration nozzles. Inspections performed satisfactorily.
	3/03	VT-2	Performed EVT-2 exam on all instrument penetration nozzles. Inspections performed satisfactorily.
	3/01	VT-2	Performed EVT-2 exam on all instrument penetration nozzles. Inspections performed satisfactorily.
	1993	LP or MT	Section XI performed once per interval. Last inspection was 1993. No indications.
Vessel ID Brackets	3/17	EVT-1	Reinspected 4 Steam Dryer Support Bracket indications recorded on 3 of 4 brackets in 2011. No significant change in condition was observed. One flaw was reported to be smaller than previously reported in 2013. Other locations saw no change.
		UT	Reinspected 4 Steam Dryer Support Brackets with indications recorded on 3 of 4 brackets in 2011. No significant change noted from previous inspection.
		VT-1	Reinspection of upper and lower bracket attachment weld on three surveillance specimen holders. NRI.
	4/15	EVT-1	Reinspected 4 Steam Dryer Support Bracket indications recorded on 3 of 4 brackets in 2011. No significant change from 2013, minor changes noted likely inspection uncertainty.

		UT	Reinspected 4 Steam Dryer Support Bracket indications recorded on 3 of 4 brackets in 2011. No significant change noted from 2013, minor changes noted likely inspection uncertainty.
	5/13	EVT-1	Examined 4 Steam Dryer Support Brackets. Indications recorded on 3 of 4 brackets.
		UT	Detected indications on all 4 lugs with UT. Length and thru-wall data was recorded for flaw characterization and evaluation.
		EVT-1/ VT-1	Examined 8 Feedwater Sparger and 2 Guide Rod brackets to the RPV wall – No indications noted
		VT-1	Examined the accessible interface area between the pin and the top of the end bracket on all 8 Feedwater Sparger brackets. No wear noted.
	4/11	EVT-1	Examined 4 Steam Dryer Support Brackets. Indications recorded on 3 of 4 brackets. Informational UT performed to obtain depth measurements.
		VT-3	Examined 8 Feedwater Sparger brackets to the RPV wall – No indications noted
	4/09	N/A	No examinations performed.
	3/07	VT-3	0 and 180 degree Guide Rod brackets to the RPV wall. No indications noted.
		VT-1	Surveillance specimen holder attachment welds (6) to the RPV wall. No indications noted.
	3/05	EVT-1	No inspections performed.
	3/03	EVT-1	Examined 10 attachment welds per BWRVIP requirements. No indications noted.

	3/01	EVT-1	3 of 4 steam dryer brackets completed with no indications noted.
	1988, 1993, and 1997	VT-1 and VT-3	Section XI performed once per interval. Dryer, surveillance capsule holder.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer	3/17	VT-1/ EVT-1	Reinspected all Steam Dryer repair clips. Newly identified indication on Bank 2, Clip 4. Flaw evaluation performed supports operation for at least 1 cycle. All other indications show no change from previous inspections.
		EVT-1	Reinspected stop hole repairs in Banks 2 and 5 as well as previous indications on the 225 degree Lifting Rod to Collar Lock welds. No change in previous conditions.
		VT-1	Reinspected 20 BWRVIP-139 baseline welds, including Tie Bars, Lifting Lugs, Hold Down Assembly tack welds, Vane welds, and Center Baffle Plate and Hood Vertical welds. Locations with indications showed no discernable change.
		VT-1	Reinspection of bolted repair A-A and B-B on Bank 2.
		EVT-1	Reinspected indications in guide rod channel, and skirt, no change - inspection also notes two locations are most likely a crud lines.
	4/15	VT-1/ EVT-1	Examined previous indication on 225 degree Lifting Rod to Collar Lock welds – no change noted. Re-inspected other 3 steam dryer lifting lug and rod assemblies and existing indications at lifting eye tack welds and at lifting lug collar weld, no change.
		VT-1	Examined 4 Hold Down Assembly Shaft and Swing Bar tack welds.

		VT-1	Examined top and side surface support ring 110-250 degrees NRI Re-inspected 23 welds BWRVIP-139 baseline welds, no new indications.
		VT-1	Reinspected lower tie bar between bank 5 and 6 crack indications, no change. Stop drill performed and inspection shows the crack tip was captured.
		EVT-1	Examined previous indication on 225 degree Lifting Rod to Collar Lock welds – no change noted.
	5/13	VT-1	Examined previous indications on 4 Hold Down Leveling screws– no change noted.
		VT-1	Examined 4 Hold Down Assembly Shaft and Swing Bar tack welds.
		VT-1	Examined Gusset welds at 90 degree Bank 6 and 270 degree Bank 1
		VT-1	Examined 14 Upper Tie Bars and attachment welds.
		VT-1	Examined previous indication on 1 Lower Tie Bar attachment weld – identified a continuation of this indication down the side of the stiffener that was not noted last outage – possible growth.
		VT-1	Examined End Panel to side Panel Vertical Bank welds on Banks 1, 2, 5 and 6
		VT-1	Examined Horizontal Welds 1, 2, 3, 4, 5 and 6 on Outer Banks 1 and 6.
		VT-1	Examined Expanded Metal Welds on Vertical Banks 1, 2 and 6
		VT-1	VT-1 of 4 hold-down assemblies. No indications noted.

	4/11	VT-1	Examined 11 lower tie bars between banks – 1 indication found evaluated acceptable for service based on BWRVIP-139 guidance.
		VT-1	Examined existing indications on inner bank vertical seam welds and hold down assembly slot– no changes noted
		VT-1/ EVT-1	Examined existing indications on the 225 degree lifting rod to lifting lug tack welds – new indication found. Expanded scope to include all 4 rods. Indications noted on expanded scope lifting rod to lifting lug tack welds. All indications evaluated acceptable for 1 cycle of operation without repair.
		UT	UT examined visual indication identified in 2009 in base of 225 degree lifting rod. Depth of indication confirmed to be shallow. UT examined the 135 deg lifting rod to lifting lug tack weld indication. Confirmed depth to be shallow.
	4/09	EVT-1 VT-1/VT-3	Performed examinations to complete the BWRVIP-139 baseline inspection scope. This included the drain channel welds underneath the dryer. New indications were noted on the inner bank vertical seam welds on the vane side and two indications on the 225 degree lifting lug. Examined several existing indications for change, no change noted from previous inspection results.
	3/07	VT-1	VT-1 of 4 hold down assemblies. No indications noted.
		EVT-1/ VT-1	Inspected all previous dryer bank repair locations. Inspections included bolted repairs, bank clips, repair clips, lower stiffeners and previous stop holes. Two new indications were noted. Steam Dryer Bank 5, Clip 6 has a 1.12 inch indication in

			the weld HAZ and repair area Bank 4, Clip 6 has a hole (weld defect) approximately 1/8 inch in diameter in the existing clip weld. All other repair areas remain unchanged from previous examinations.
		VT-3	Performed a VT-3 on all accessible areas (repair areas), hold-down and support lug, lifting eye, horizontal and vertical welds, upper/lower support ring and guides, dryer banks, manway covers and stabilizer bars. No indications noted.
Moisture Separator	3/17	N/A	No examinations performed.
	4/15	VT-3	General visual from periphery, 360 degrees. General visual from top of standpipes, tie straps and standpipe gussets. Inspection scope is looking for structural integrity, function and any anomalies. 36 Shroud head T bolt pin and window inspection, looking for fretting wear.
	5/13	EVT-1/ VT-1	Examined previously identified indications on 4 Standpipe102 Gussets – no changes noted.
		VT-1	Examined Tie Strap 43-50
		VT-1	Examined 7 Shroud Head Bolts
		UT	UT examined 33 old model original shroud head bolts. No indications detected
	4/11	EVT-1 VT-1	Examined standpipe #102 and all associated welds, tie bars and support components. No change in previously reported indications.
	4/09	EVT-1/ VT-1	Examined retired in place LVI tubing and supports. No indications noted. Examined standpipe #102 and all associated welds, tie bars and support components. Indications noted on all four

			gusset plates. Examined six shroud head bolts for surface condition change and cracking at the lower shaft to tee head weld. No indications noted.
	3/07	VT-3/VT-1	Performed a VT-3/VT-1 on all accessible areas, standpipe gussets, SHB-Pin-Sleeve, tie straps and separator internals. Two new indications were noted. One tie strap was found bent between standpipes 43 and 50 and a second gusset was found cracked on standpipe #102. No other indications were noted.
Feedwater Sparger	3/17	EVT-1	3 Sparger End Bracket plate welds. NRI.
		VT-1	2 End Bracket pins with slight wear noted in one location.
	4/15	VT-3/VT-1	Examined the accessible interface area between the pin and the top of the end bracket on 2 Feedwater Sparger brackets. No wear noted. Examined weld between FW sparger end plate and bracket end plate - NRI
BWRVIP-75-A Dissimilar Metal Welds	3/17	UT	N5B, Category D, Automated PA exam. Minor fabrication flaws acceptable per IWB-3500. 97% Risk Informed and 97% Extended Volume coverage achieved. N6A, Category D, Automated PA exam. No recordable indications. 100% Risk Informed and 100% Extended Volume coverage achieved.
	4/15	UT	N2A, Category D, Manual PA exam. No Recordable Indications. 100% ASME and 100% Full Volume coverage achieved. N2E, Category D, Manual PA exam. No Recordable Indications. 100% ASME and 100% Full Volume coverage achieved.

			N2C, Category D, Manual PA exam. Previously recorded planar indication was evaluated as contained within the cladding and is acceptable. 100% ASME and 100% Full Volume coverage achieved. N2D, Category D, Manual PA exam. ASME XI IWB-3514-2 unacceptable planar flaw (1.29" L x 0.27"D) recorded at N1R19- third re-look performed with no growth noted. 100% ASME and 100% Full Volume coverage achieved. N2E, Category D, Manual PA exam. No Recordable Indications. 100% ASME and 100% Full Volume coverage achieved.
	4/11	UT	N1C, Category D, Manual Exam. Previously recorded acceptable midwall indications were observed with no change noted. 100% ASME and 100% Full Volume coverage achieved. N1D, Category D, Manual Exam. (1) ASME XI IWB-3514-2 acceptable axial planar flaw (0.5" L x 0.05" D) in the safe end I.D. Additional surface preparation was performed this outage. 97.5% ASME and 91.75% Full Volume coverage achieved. N1E, Category D, Manual Exam. Previously recorded acceptable midwall indications were observed with no change noted. 97.5% ASME and 89.2% Full Volume coverage achieved. N2D, Category D, Auto Exam. (1) ASME XI IWB-3514-2 unacceptable planar flaw (1.29" L x 0.27"D) recorded at N1R19- second re-look performed with no growth noted.

			N5B, Category D, Manual Exam. No Recordable Indications. 94.3% ASME and 93.1% Full Volume coverage achieved. N6A, Category D, Manual Exam. No Recordable Indications. 100% ASME and 100% Full Volume coverage achieved.
	4/09	UT	N1A, Category D, Auto Exam: (2) ASME XI IWB-3514-2 acceptable planar flaws in the safe end ID N1B, Category D, Auto Exam: (3) ASME XI IWB-3514-2 acceptable planar flaws in the safe end ID N2D, Category E, Auto Exam: (1) ASME XI IWB-3514-2 unacceptable planar flaw (1.29" L x 0.27" D) recorded at N1R19 (2007) -- re-look performed with no growth noted N5A, Category D, Manual Exam: NRI

Reactor Internals Inspection History

Plant: Perry Nuclear Power Plant

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud (VIP-76, Rev 1)	1994 (RF4)	VT-3 and EVY-1	In RF4, VT-3 of entire shroud interior and EVT-1 of the H-3 and H-4 weld inside surfaces at 4 appx 1ft long sample locations. No indications.
	1997 (RF6)	EVT-1	In RF6, a Code VT-3 exam was performed on all accessible shroud exterior areas. No indications.
	1999 (RF7)	UT	In RF7, UT examination of the H-3, H-4, H-6A and H-7 welds was performed in accordance with the Category B Plant guidelines of BWRVIP-01. No indications.
	2005 (RF10)	UT	In RF10, UT examinations of the H-3 and H-4 welds with the Tecnatom ID tool and H-6A and H-7 with the GE OD Tracker. H-4 and H-6A were two sided exams and H-3 and H-7 were one-sided exams. Shallow cracking was found in H-7. It was less than 10% of the inspected length of 67% of the weld.
	2015 (RF15)	UT and EVT-1	In RF15, UT examination of the H-3, H-4, H-6a and H-7 welds was performed with the Westinghouse MAXSUM tool from the OD. No indications observed on H-3, H-4, or H-6a. The same shallow cracking discovered in RF10 was observed on H-7 and is still less than 10% of the inspected length of 77% of the weld. EVT-1 exams were performed on the intersection of H4 and V15 on both the OD and ID in response to OE of axial cracking in core shrouds. No indications.

Shroud Support (VIP-38)	1990 (RF2)	VT-3 & VT-1	In RF2, VT-3 of shroud support plate and VT-1 of the shroud support plate access hole cover. No indications.
	1996 (RF5)	VT-3 & VT-1	In RF5, VT-3 of shroud support plate and VT-1 of the shroud support plate access hole cover. No indications.
	1999 (RF7)	EVT-1	In RF7, baseline EVT-1 exams of the H-8 and H-9 were performed in accordance with BWRVIP-38. No Indications.
	2001 (RF8)	VT-1	In RF8, re-seating of jet pump no. 5 provided access to the H-10, H-11 and H-12 welds of the shroud support leg at 90 degrees and approximately 10 degrees of the underside of H-8 and H-9 so they were visually examined with at least VT-1 resolution. No indications.
	2007 (RF11)	EVT-1 & VT-1	In RF10, jet pump no. 6 was removed and re-seated due to excess leakage at the transition piece. While disassembled approximately 10 degrees of the underside of H-8 and H-9 were examined with at least VT-1 resolution. Also, the H-10, H-11 and H-12 welds of the shroud support legs at 90 and 120 degrees were examined with EVT-1 resolution. Coverage was approximately 35-50% for the welds of the 90 degree leg and 25% for the welds of the 120 degree leg.
	2011 (RF13)	EVT-1, VT-1, & VT-3	In RF13, H8 was inspected from above the core plate in the open areas between jet pumps at 0 and 180 degrees. EVT-1 resolution was obtained with 15% coverage of the circumference. In addition all accessible areas of the shroud support plate were examined, VT-3, meeting ASME B-N-1 requirements. There were no relevant indications. Additionally in RF13, jet pump numbers 15 and 16 were disassembled with the mixer assemblies replaced with a wider

			wedge installed on the new mixers. The wider wedges were installed due to wedge/restrainer bracket degradation found in jet pump 15. While disassembled, approximately 10 degrees of the underside of H-8 and H-9 were examined with EVT-1 equivalent resolution. Also, the H-10, H-11 and H-12 welds of the shroud support leg at 270 degrees were examined with EVT-1 equivalent resolution. Coverage was approximately 35-50% for the welds of the 270 degree leg. There were no relevant indications.
	2015 (RF15)	UT and EVT-1	In RF15, a UT exam was performed on the H-9 weld. One non-geometric indication was discovered between JP1 and JP2. An EVT-1 exam was performed on H-9 between JP1 and JP2 in response to that indication. No indications were observed from the visual exam. The EPRI NDE Center provided a peer, independent review and their analysis determined that the indication is characteristic of an embedded weld fabrication flaw and does not exhibit characteristics of service induced degradation.
	2017 (1R16)	EVT-1	In 1R16, H8 was inspected using the Stinger tool from 0-22 degrees, 180-202 degrees, and 338-0 degrees, obtaining EVT-1 resolution of 80%, 50%, and 70% coverage, respectively. This equates to 12% EVT-1 coverage of the circumference. No relevant indications.
Core Spray Piping (VIP-18, Rev 1)	1989-1996 (RF1 thru RF5)	CVT-1	1 mil wire resolution VT-1 (i.e., CVT-1) exams of the core spray internal piping has been performed every outage since startup in accordance with IEB 80-13. No indications.
	1997 (RF6)	EVT-1	In RF6, Baseline BWRVIP-18 EVT-1 examinations were performed on all the core spray piping welds. No indications.

	1999 (RF7) 2001 (RF8) 2003 (RF9)	EVT-1 EVT-1 EVT-1	In RF7, RF8, and RF9 core spay piping weld exams were performed in accordance with the re-inspection requirements of BWRVIP-18. No indications. Note that after a couple outages without having re-clean the welds, all the welds inspected in RF9 were pre-cleaned by hydrolazing
	2005 (RF10)	EVT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. Exams did find one cracked tack weld on one of the 6-bolt core spray piping shroud flange to shroud connections (P8).
	2007 (RF11)	EVT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. Re-examination of cracked tack weld on one of the 6-bolt core spray piping shroud flange to shroud connections (P8) found in RF10 found no changes.
	2009 (RF12)	EVT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2011 (RF13)	EVT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2013 (RF14)	EVT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2015 (RF15)	EVT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2017 (1R16)	EVT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. BWRVIP-18 Rev 2-A was implemented for 1R16. No indications.
Core Spray Sparger (VIP-18, Rev 1)	1989-1996 (RF1 thru RF5)	CVT-1	1 mil wire resolution VT-1 (i.e., CVT-1) exams of the core spray spargers has been performed every outage since startup in accordance with IEB 80-13. No indications.

	1997 (RF6)	EVT-1 & CVT-1	In RF6, Baseline BWRVIP-18 EVT-1 & CVT-1 examinations were performed on all the core spray sparger welds. No indications.
	1999 (RF7)	EVT-1 & MVT-1	In RF7 core spay sparger weld exams were performed in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2001 (RF8) 2003 (RF9)	EVT-1 & VT-1 EVT-1 & VT-1	In RF8 and RF9 core spay sparger weld exams were performed in accordance with the re-inspection requirements of BWRVIP-18. No indications. Note that after a couple outages without having re-clean the welds, all the welds inspected in RF9 were pre-cleaned by hydrolazing.
	2005 (RF10)	EVT1 & VT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2007 (RF11)	EVT-1 & VT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2009 (RF12)	EVT-1 & VT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2011 (RF13)	EVT-1 & VT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2013 (RF14)	EVT-1 & VT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
	2015 (RF15)	EVT-1 & VT-1	Examined in accordance with the re-inspection requirements of BWRVIP-18. No indications.
Top Guide (Rim, etc.) (VIP-26-A) & Top Guide Grid (VIP-183)	1989 (RF1)	VT-3	Top Guide periphery, including 90 studs and tack welds, examined in RF1. No indications.

	1994 (RF4)	VT-3	Top Guide Grid examined in RF4. No indications.
	1999 (RF7)	VT-1 & VT-3	In RF7, performed VT-3 of the Top Guide assembly in accordance with ASME Category B-N-2 and VT-1 of the studs and tack welds in accordance with BWRVIP-26. No indications.
	2005 (RF10)	VT-3	Code B-N-2 exam of accessible portions of Top Guide grid. Due to ID Core Shroud exams, a significant number of the grid cells were vacated and accessible for inspection.
	2011 (RF13)	VT-3	Examined in accordance with the re-inspection requirements of BWRVIP-26 and ASME Code B-N-2. No indications.
		EVT-1	Baseline BWRVIP-183 exams performed (i.e., rim areas containing grid weld and two cells in the same plane as the grid weld). No Indications.
	2017	EVT-1	Exams performed in accordance with BWRVIP-183 re-inspection requirements (i.e., rim areas containing grid weld and two cells in the same plane as the grid weld). No Indications.
Core Plate (Rim, etc.) (VIP-25; not applicable to BWR/6s)	1989 (RF1)	VT-3	Accessible core plate areas and fuel support castings examined in RF1. No indications.
	1994 (RF4)	VT-3	All of the hold down bolts examined from shroud interior in RF4. No indications.
	1999 (RF7)	VT-3	In RF7, performed VT-3 exam of the core plate areas made accessible by replacement of 5 Control Rod blades in accordance with ASME Category B-N-2. No indications.
SLC (VIP-27-A)	N/A	N/A	Not applicable to this plant

Jet Pump Assembly (VIP-41, Rev 1)	1989-1996 (RF1 thru RF5)	VT-1 & VT-3	Examine jet pump braces, hold down beams, sensing lines, restrainer bracket set screws and mixer assemblies in accordance with various GE SILs/RICSILs. Set screw gaps identified in RF5 and RF6.
	1997 (RF6)	EVT-1 VT-3	In RF6, baseline EVT-1 exams were performed on all the jet pump riser elbow welds. No crack indications.
	1999 (RF7)	EVT-1 & VT-3	In RF7, the jet pump mixers were removed and cleaned with ultra-high pressure. Augmented VT-3 examinations were performed on the jet pump mixer throats (pre and post cleaning) and the restrainer bracket set screws. Most of the gaps detected in RF5 and RF6 were eliminated upon re-seating the mixers. The couple that remain are very minor and within the "no fatigue" acceptance criteria.
	2001 (RF8)	EVT-1 & VT-3	With the exception of the IN-1 and IN-2 welds of 6 jet pumps, in RF8, baseline BWRVIP-41 EVT-1 exams were performed on all of the low, medium and high priority exam points of jet pumps 1 through 10,. No indications. Also VT-3 examined all the jet pump set screws for gaps. 11 of the 20 jet pumps had gaps were found to have gaps that were less than 0.0020" in one or more of their set screws. Gaps evaluated as operable for at least one cycle with long term remedy to be determined.
	2003 (RF9)	EVT-1, VT-3 & UT	In RF9, performed EVT-1 exams of the IN-1 and IN-2 welds of jet pumps 1 through 10 not examined in RF8. Additionally, baseline EVT-1 exams of the remaining High priority welds (RS-3 on jet pumps 11 through 20 were also performed). Performed VT-3 exams of the jet pump set screws and wedges. Gaps similar to previous outages were found and evaluated for continued operation.

			Also performed UT of the jet pump hold-down beam BB-1 and BB-2 locations (Note: PNPP's jet pump beams were replaced with Type 2 beams in RF4). Supplemental EVT-1 exams were performed on the BB-3 areas. With the exception of the set screw gaps, no indications.
	2005 (RF10)	EVT-1 & VT-1	In RF10, performed re-examination (EVT-1) of the riser elbow welds on jet pumps 1 through 10. No indications. Also performed VT-1 examination of all 20 jet pump wedge assemblies. Found minor wear on the wedge of JP-15. Expanded scope in accordance with BWRVIP-41 and found no other indications. The wear was evaluated as acceptable for one cycle of operation.
	2007 (RF11)	EVT-1 & VT-1	In RF11, performed examination of the all the high and medium priority welds on the reactor recirculation Loop B jet pumps (i.e., 11 – 20). No indications. Also performed VT-1 examination of all 20 jet pump wedge assemblies. Found the minor wear on wedge of JP-15 that was first identified in RF10 to be unchanged. Also performed VT-3 examinations on the instrument line attachment welds of all 20 jet pumps.
	2009 (RF12)	EVT-1, VT-1 & UT	In RF12, performed examination of mixer inlet areas for crud buildup on jet pumps 3 & 13, RS-3's for jet pumps 1-10, and RS1 & RS2's for jet pumps 11-16. Also performed VT-1 examination of all 20 jet pump wedge assemblies. New wedge wear found on jet pumps 6 and 13. Further expanded scope inspections of jet pumps in accordance with BWRVIP–41 found set screw gaps on jet pumps 5, 13 & 14. Gaps were analyzed and jet pumps 5, 13 & 14 were justified for continued operation. Also performed VT-3 examinations on the instrument line

			attachment welds of jet pumps 1-10 and UT of the jet pump hold-down beam BB-1, BB-2, & BB-3 locations with no indications.
	2011 (RF13)	EVT-1 & VT-1	In RF13, performed inspection of mixer inlet areas for crud buildup on jet pumps 3 and 13, RS-8 & RS-9's jet pumps 1/2, 3/4, 7/8, 9/10, 11/12, 15/16, 17/18, and 19/20 (5/6 and 13/14 examined under scope expansion in RF12), WD-1 pumps 1-20, WD-2 pumps 1-20, AS-1 and AS-2 pumps 5, 6, 13, & 14, and additional examination of the set screws and wedges on jet pumps 15 and 16 before and after the replacement of the mixers and the jet pump 15 & 16 wedges as a result of wedge wear identified during the initial IVVI (OE33556).
	2013 (RF14)	EVT-1 & VT-1	In RF14 performed inspection of mixer inlet areas for crud buildup on jet pumps 3 and 13, RS-6 on jet pumps 1, 3, and 5, & RS-7 on jet pumps 2, 4, and 6. WD-1 pumps 1-20, WD-2a and WD-2b pumps 1-20, AS-1 and AS-2 pumps 5, 6, 13, and 14. IN-1 & IN-2 on jet pumps 1-6. RB-1b, RB-1d, RB-2b, and RB-2d on pumps 1, 3, 5, 7, and 9. RB-1a, RB-1c, RB-2a, and RB-2c on jet pumps 2, 4, 6, 8, and 10. Set screw gaps were identified and justified for continued operation on jet pumps 5, 13 and 14.
	2015 (RF15)	EVT-1 and VT-3	In RF15, performed inspection of mixer inlet areas for crud buildup on jet pumps 3 and 13, WD-1 pumps 1-20, WD-2a and WD-2b pumps 1-20, AS-1 and AS-2 on pumps 5, 6, 13, 14 both vessel side and shroud side; AS-2 shroud side only on pump 15. Wedge tapping was performed on the vessel side of pump 14 to reduce set screw gap. No new wedge wear identified.
	2017 (1R16)	EVT-1, VT-1, and	In RF16, performed inspection of mixer inlet areas for crud buildup on jet pumps 3

		VT-3	and 13, WD-1 pumps 1-20, WD-2a and WD-2b pumps 1-20, AS-2 shroud side on pumps 6 and 15, JPLAW on all pumps except 2 and 9. Stinger tool was able to get better angles on the wedges and very slight wear was identified on pumps 3, 5, 6, 8, 13, and 14. No observable changes to the vertical position of the wedges indicates wear was already present but not previously observed thus there were no changes to the condition of the wedges from 1R15 to 1R16.
Jet Pump Diffuser (VIP-41, Rev 1)	2001 (RF8)	EVT-1	In RF8, baseline BWRVIP-41 EVT-1 exams were performed on all of the diffuser welds of jet pumps 1 through 10. No indications.
	2007 (RF11)	EVT-1	In RF10, baseline BWRVIP-41 EVT-1 exams were performed on all of the diffuser welds of jet pumps 11 through 20. No indications.
	2013 (RF14)	EVT-1	In RF14, DF-1, DF-2, DF-3a, DF-3b, and AD-2 were examined on jet pumps 1-6.
CRD Guide Tube (VIP-47-A)	1999 (RF7)	VT-1 & EVT-1	In RF7, performed VT-1 of alignment pins and EVT-1 of the welds of 5 Control Rod Guide Tubes in accordance with BWRVIP-47. No indications.
	2001 (RF8)	VT-1 & EVT-1	In RF8, performed VT-1 of alignment pins and EVT-1 of the welds of an additional 4 Control Rod Guide Tubes in accordance with BWRVIP-47 to meet the 5% completion requirements of BWRVIP-47. No indications.
	2005 (RF10)	VT-1 & EVT-1	In RF10, performed VT-1 of alignment pins and EVT-1 of the welds of an additional 5 Control Rod Guide Tubes in accordance with BWRVIP-47. No indications. The final CRD Guide Tube exams to meet the total of 10% requirement (4 more), are scheduled for RF11.

	2007 (RF11)	VT-1 & EVT-1	In RF11, performed VT-1 of alignment pins and EVT-1 of the welds of an additional 4 Control Rod Guide Tubes in accordance with BWRVIP-47 to meet the ultimate 10% completion (i.e., 18 out of 177) requirements of BWRVIP-47. No indications.
CRD Stub Tube	N/A	N/A	Not applicable to this plant.
In-Core Housings (LPRMs)	2003 (RF9)	VT-3	In RF9, performed VT-3 of a random 10% sample of the LPRM's in response to Revision 2 to SIL 409. No indications.
	2005 (RF10)	VT-3	In RF10, performed VT-3 of a random 10% sample of the LPRM's in response to Revision 2 to SIL 409. No indications.
	2007 (RF11)	VT-3	In RF11, performed VT-3 of a random 10% sample of the LPRM's in response to Revision 2 to SIL 409. No indications.
	2009 (RF12)	VT-3	In RF12, performed VT-3 of a random 10% sample of the LPRM's in response to Revision 2 to SIL 409. No indications.
	2011 (RF13)	VT-3	In RF13, performed VT-3 of a random 10% sample of the LPRM's in response to Revision 2 to SIL 409. No indications. Replaced 6 LPRM dry tubes to address stuck detectors and the potential for cracking as these components have reached end of life. (Additional replacements planned for subsequent outages.)
	2013 (RF14)	VT-3	In RF13, performed VT-3 of a random 10% sample of the LPRM's in response to Revision 2 to SIL 409. No indications.
	2015 (RF15)	VT-3 and VT-1	In RF15, performed VT-3 of a random 10% sample of the LPRM's in response to SIL 409. No indications. Replaced 2 LPRM dry tubes to address the potential for cracking as these components have reached end of life. (Additional

			replacements planned for subsequent outages.)
	2017 (1R16)	VT-1	In 1R16, performed VT-1 of a random 10% sample of the LPRM's in response to SIL 409. No indications. Replaced 4 LPRM dry tubes. (Additional replacements planned for subsequent outages.)
Dry Tubes (IRMs & SRMs)	1989 (RF1) 1990 (RF2) 1994 (RF4) 1999 (RF7)	VT-3 VT-3 VT-3 VT-3	In RF1, RF2, RF4 and RF7, performed VT-3 of upper 2 ft of all IRMs and SRMs in accordance with SIL 409 and RICSIL 73. No indications.
	2001 (RF8) 2003 (RF9) 2005 (RF10) 2007 (RF11) 2009 (RF12) 2011 (RF13) 2013 (RF14)	VT-3 VT-3 VT-3 VT-3 VT-3 VT-3 VT-3	In RF8, RF9, RF10, RF11, RF12, RF13 and RF14 performed VT-3 of upper 2 ft of half the IRM's and SRM's in each outage. No indications.
	2015 (RF15)	VT-1	In RF15, inspected 4 SRMs. Replaced 4 SRM dry tubes to address the potential for cracking as these components have reached end of life. (Additional replacements planned for subsequent outages.)
	2017 (1R16)	N/A	Replaced 2 IRMs. (Additional replacements planned for subsequent outages.)
Instrument Penetrations (VIP-49-A)	1989-2005 (RF1 thru RF10)	VT-2	Undervessel (i.e., through the skirt manway) and inside the bioshield direct visual examination for leakage performed every refueling outage. No indications.
	2005 (RF10)	PT	SIL 571 surface examinations of the socket weld connection and all accessible penetration base metal surfaces for two of the 14 level instrument penetrations. No indications.

	2007-2017 (RF11 to RF16	VT-2	Undervessel (i.e., through the skirt manway) and inside the bioshield direct visual examination for leakage performed every refueling outage. No indications.
Vessel ID Brackets (VIP-48-A)	1989 (RF1) 1994 (RF4) 1996 (RF5)	VT-1 & VT-3 VT-1 & VT-3 VT-1 & VT-3	Section XI examinations of the jet pump riser brace, feedwater sparger bracket, core spray piping bracket, surveillance specimen capsule bracket, steam dryer, and guide rod vessel attachment welds. Scheduled such that each attachment weld is examined once an interval. The last welds to be examined were the surveillance capsule bracket attachment welds in RF5. No indications.
	1999 (RF7)	MVT-1	In RF7, performed MVT-1 of the Feedwater Sparger brackets in accordance with the normal frequency of ASME Category B-N-2, but utilized the MVT-1 method in accordance with BWRVIP-48. No indications.
	2001 (RF8)	EVT1	In RF8, performed EVT-1 of the Steam Dryer support brackets and Jet Pump Riser Brace attachment welds in accordance with the normal frequency of ASME Categories B-N-2, but utilized the EVT-1 method in accordance with BWRVIP-48 and BWRVIP-41. No indications.
	2003 (RF9)	VT-3 & EVT1	In RF09, performed VT-3 of the Feedwater Sparger brackets and EVT-1 of the Core Spray piping brackets. No indications.
	2009 (RF12)	VT-3	In RF12, performed VT-3 of the Guide rod support bracket attachments, surveillance sample holder. Surveillance sample holder at 177° exhibited a bent bail handle, justified for continued operation.
	2011 (RF13)	EVT-1 & VT-3	In RF13, performed EVT-1/VT-3 of Feedwater sparger bracket to vessel welds at 005, 055, 065, 115, 125, 175, 185, 235, 245, 295, 305, and 355 degrees. Also performed EVT-1 of Dryer Bracket to

			Vessel welds at 030, 090, 150, 210, 270, and 300 degrees. No relevant indications found.
	2013 (RF14)	VT-3	In RF14, performed VT-3 of the feedwater bracket pins at 005, 055, 065, 115, 125, 175, 185, 235, 245, 295, 305, and 355 degrees for the purposes of identifying and monitoring potential pin to bracket wear. Some minor wear, non-relevant indications, identified.
LPCI Coupling (VIP-42, Rev 1)	1994 (RF4)	VT-3	The LPCI deflectors (inside the core shroud) were examined in RF4. No indications.
	1997 (RF6)	VT-3	The LPCI internal piping, including the couplings, was examined in RF6. No indications.
	1999 (RF7)	MVT-1	In RF7, performed MVT-1 baseline exams on the welds of all three LPCI couplings (A, B & C) in accordance with BWRVIP-42. No indications.
	2003 (RF9)	EVT-1	In RF9, performed EVT-1 exams on the welds of the LPCI "A" coupling in accordance with BWRVIP-42. No indications.
	2005 (RF10)	VT-3	Although not required by BWRVIP, performed a VT-3 of the Low Pressure Core Injection (LPCI) deflectors and attachment welds from inside the shroud. Performed while the periphery of the inside of the shroud was accessible due to vacating the cells for the Tecnatom ID Core Shroud inspection tool. No indications.
	2007 (RF11)	EVT-1	In RF11, performed EVT-1 exams on the welds of the LPCI "B" coupling in accordance with BWRVIP-42-A. No indications.
	2011 (RF13)	EVT-1	In RF13, performed EVT-1 exams on the welds of the LPCI "C" coupling in

			accordance with BWRVIP-42-A. No relevant indications.
	2015 (RF15)	EVT-1 and VT-1	In RF15, performed EVT-1 exams on the welds of the LPCI "A" coupling in accordance with BWRVIP-42-A and performed VT-1 exams on the LPCI flow deflectors on couplings "A", "B", and "C". No relevant indications.
Lower Plenum	2015 (RF15)	EVT-1 and VT-3	In RF15, bottom head drain line work permitted access to the lower plenum. EVT-1 exams were performed on the CRDH vessel attachment welds at locations 34-15, 30-27, 34-11, 30-07, 34-31, 30-15, and 30-35, and ICH vessel attachment welds at locations 32-29, 32-09 and 32-33. VT-3 exams were also performed for locations 30-31 and 30-11. No relevant indications.
RPV Interior (not a BWRVIP scope item)	2003 (RF9)	VT-3	The RPV Interior exam is performed in accordance with ASME Category B-N-1 every other outage and is not usually reported on herein. However, RF9's examination results are noteworthy as the RPV Interior exams identified deposits on the vessel interior walls in the areas adjacent to the Main Steam nozzles. Subsequently in extent of condition exams, similar deposits were found on the Steam Dryer outside shroud surfaces in areas corresponding to the Main Steam nozzles. The deposits are extremely hard (i.e., cannot be scraped or hydrolazed off). From a BWRVIP standpoint, the deposits are considered significant as they are a result of the mitigating water chemistry (i.e., Hydrogen Water Chemistry with depleted Zinc and NobelChem).
	2005 (RF10)	VT-3	Re-inspection of the upper vessel interior (steam region) to see if there was any change in the unusual deposits that were found in RF9. The unusual deposits were still there, but they were essentially unchanged from RF9 (i.e., no further

			deposits noted).
	2007 (RF11)	VT-3	Re-inspection of the upper vessel interior (steam region) to see if there was any change in the unusual deposits that were found in RF9. The unusual deposits were still there, but they were essentially unchanged from RF9 (i.e., no further deposits noted). Also performed the ASME Code Category B-N-1 VT-3 inspections of the accessible interior surfaces. No indications.
	2009 (RF12)	VT-3	Re-inspection of the upper vessel interior (steam region) to see if there was any change in the unusual deposits that were found in RF9. The unusual deposits were still there, but they were essentially unchanged from RF9 (i.e., no further deposits noted).
	2011 (RF13)	VT-3	Re-inspection of the upper vessel interior (steam region) to see if there was any change in the unusual deposits that were found in RF9. The unusual deposits were still there, but they were essentially unchanged from RF9 (i.e., no further deposits noted). Also performed the ASME Code Category B-N-1 VT-3 inspections of the accessible interior surfaces. No indications.
	2013 (RF14)	VT-3	Re-inspection of the upper vessel interior (steam region) to see if there was any change in the unusual deposits that were found in RF9. The unusual deposits were still there, but they were essentially unchanged from RF9.
Steam Dryer (VIP-139-A)	1990 (RF2)	VT-3	SIL 472 exams of the Steam Dryer drain channels for cracking. No indications.
	2003 (RF9)	VT-3	General exam of Steam Dryer exterior looking for extent of condition of tenacious crud found on the vessel interior. Also used a Video-Ray submersible to examine the Steam Dryer

			interior. Other than heavy crud build-up on the 90 and 270 degree sides, there were no indications.
	2005 (RF10)	VT-3	General exam of Steam Dryer exterior looking for gross failures. No indications. Detailed BWRVIP-139 Steam Dryer baseline exams scheduled for RF11.
	2007 (RF11)	VT-3	General exam of Steam Dryer exterior at the 90 and 270 degree sides looking for gross failures and for any changes in the tenacious crud found in RFO9. No indications. Detailed BWRVIP-139 Steam Dryer baseline exams that were originally scheduled for RF11 were deferred to RFO12.
	2009 (RF12)	VT-1	Completed base line inspections per BWRVIP-139. Linear indications found in LB3a (145° lifting rod bracket), LA4 (35° lifting lug tack weld), LD4 (325° lifting lug tack weld), a bent lower guide rod guide at 180°, and several small linear, horizontal, vertical, and radial indications in the upper support ring. All indications were analyzed and justified for continued operation. No change in stucco crud deposits.
	2011 (RF13)	VT-1	In RF13 condition monitoring inspections were performed as follow up to the RF12 base line inspections per BWRVIP-139. Linear indications found in LB3a (145° lifting rod bracket), LA4 (35° lifting lug tack weld), LD4 (325° lifting lug tack weld), a bent lower guide rod guide at 180°, and several small linear, horizontal, vertical, and radial indications in the upper support ring found in RF12 were essentially unchanged. Several newly identified (i.e., may have previously existed and were not detected during RF12 baseline exams) very small linear indications were also found in the upper support ring and were justified for

			continued operation. No change in stucco crud deposits.
	2013 (RF14)	VT-1	In RF14 condition monitoring inspections were performed as follow up to the RF12 base line inspections per BWRVIP-139. Linear indications found in LB3a (145° lifting rod bracket), LA4 (35° lifting lug tack weld), LD4 (325° lifting lug tack weld), and several small linear, horizontal, vertical, and radial indications in the upper support ring found in RF12 were essentially unchanged. Several newly identified (i.e., may have previously existed and were not detected during RF12 baseline exams) very small linear indications were also found in the upper support ring and were justified for continued operation. No change in stucco crud deposits.
	2015 (RF15)	VT-1	In RF15, condition monitoring inspections were performed as follow up to the RF12 base line inspections per BWRVIP-139. Linear indications found in LB3a (145° lifting rod bracket), LA4 (35° lifting lug tack weld), LD4 (325° lifting lug tack weld), and several small linear, horizontal, vertical, and radial indications in the upper support ring found in RF12 and RF14 were essentially unchanged. No change in stucco crud deposits.
	2017 (1R16)	VT-1	In 1R16, condition monitoring inspection was performed on the longest linear indication on the upper support ring. No changes.
Access Hole Cover (VIP-180)	1996 (RF5)	VT-1	VT-1 examination of the access hole cover welds in accordance with SIL-409.
	2007 (RF11)	EVT-1	EVT-1 examination of the access hole cover welds in accordance with the draft BWRVIP AHC Inspection and Evaluation Guidelines. No indications.

	2013 (RF14)	EVT-1	EVT-1 examinations on both the Access Hole Cover (AHC) Ring to Shroud Support Plate and Cover to Ring welds at 0 degrees.
Category C & E Dissimilar Metal (DM) Weld Exams. Perry has 23 Category C DM welds, 2 Category E DM welds (one weld overlay repaired and one just monitoring), and no Category D DM welds.	2007 (RF11)	UT (Supp 10 Exams)	Examined 13 of Perry's 23 Category C dissimilar metal welds (ten N2, two N9 and one N1 Nozzle to SE welds). There were no unacceptable flaw indications. One N1 Nozzle to SE weld was not examined due to extreme hardship to access and dose concerns. Relief Request submitted following the outage to delete exam entirely based on a review of previous examination data that was obtained with non-Supplment 10 procedures but by techniques that were near equivalent to Supplement 10.
	2007 (RF11)	UT (Supp 10 Exam)	Examined Perry's Feedwater (N7) Nozzle to SE Category E dissimilar metal weld that is not weld overlay repaired. The flaw indications were found to be unchanged.
	2009 (RF12)	UT (Supp 10 Exams)	Examined 9 of the remaining 10 Perry Category C dissimilar metal welds (four N4, three N6 and two N5). Subsurface (i.e., fabrication) flaws identified in two of the N6 Nozzle to SE welds prior to RF12 by the required BWRVIP data review, and which required an IWB-3600 evaluation because they exceeded ASME XI Table IWB-3514-1 acceptance criteria, were found to be unchanged. No other unacceptable flaw indications were identified. Note that prior to RFO12, the Relief Request that was submitted for the N1 Nozzle to SE weld that was not examined in RFO11 was approved. Thus, Perry has completed all the required Category C dissimilar metal weld Supplement 10 examinations.
	2009 (RF12)	UT (Supp 11 Exam)	Examined Perry's Feedwater (N4) Nozzle to SE Category E dissimilar metal weld that is weld overlay repaired. The overlay

			exam found no unacceptable flaw indications.
	2013 (RF14)	UT (Supp 10 Exams)	Examined two Feedwater (N4) nozzle to SE welds, including one Category C weld and one Category E (i.e., flawed) weld. Also examined one Category C Core Spray (N5) nozzle SE to SE extension weld. The exams were performed using encoded Phased Array techniques. No new indications and no changes in the flawed weld.
		UT Supp 11 Exam)	Examined Perry's Feedwater (N4) Nozzle to SE Category E dissimilar metal weld that is weld overlay repaired. The exam was performed using encoded Phased Array techniques. The overlay exam found no unacceptable flaw indications.
	2017 (RF16)	UT (Supp 10 Exams)	Welds 1B13-N1A-KB and 1B13-N2E-KB were examined. Welds 1B13-N2A-KB, 1B13-N2K-KB, and 1B13-N9B-KB were deferred to 1R17. An embedded reflector was found on the N1A and was acceptable. No indications found on N2E.

Reactor Internals Inspection History

Plant: **Pilgrim**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
CORE SHROUD Shroud head bolts	RFO7	UT	RFO 7 UT all 48 bolts
	RFO8	VT	RFO 8 partial VT. No indications
	RFO10	UT	RFO 10 UT of 100% of bolts, no indications
	RFO11	Replace-ment	RFO 11 replaced 50% of bolts (even # bolts replaced per MR 19602446)
	RFO15	Removal	Removed 50% (24) of SHBs (odd # bolts) per ER 03114806 (MR 04116541)
	RFO16, 2007	VT-3	Examined 25% (6) of shroud head bolts with one relevant indication noted and dispositioned
	RFO17, 2009	VT-3	Examined 25% (6) of shroud head bolts; slight wear at SHB 18.
	RFO18, 2011	VT-3 (89)	Re-examined (2) wear locations on SHBs 4 & 18
	RFO19, 2013	VT-3 (89)	Inspected 25% (6) Shroud Head Bolts – shbs-28, 30, 32, 34, 36, & 38.
		VT-3 (89)	Re-inspected (2) wear locations on the shroud head bolts #4 & #18. No changes noted from previous outage.
	RFO20, 2015	VT-3 (89)	Re-inspected (2) wear locations on shroud head bolts #4 & #18. No changes noted from previous outage.
Shroud	RFO10 (modif. and partial VT), 11 (UT of 134" (25% of	VT-3	Shroud captured to limit extent under VT-3 exams of RPV Interior performed each period. No indications. RFO 10 PDC 94-43 VT exams only. RFO 11 VT-3 of 315 degree tie rod and core plate

	total) of vert. welds V17 and V18 from shroud I.D.) 11 (EVT-1 of 14 of 21 ring segment welds)		wedges, EVT-1 of 315 degree gusset welds.
	RFO12	EVT-1	Examined V15, V16, V17, V18, V22 and V23. Total of vertical weld examined from both sides by UT in RFO 11 and EVT 1 in RFO 12 is 46 % With partial credit for one sided examinations the total is 51 %. This is the maximum available with current tooling. No indications.
	RFO13	EVT-1	Examined Ring Segment weld V11 from the OD. (no indications).
	RFO15	EVT-1	Examined 100% vertical/or radial welds V9, V10, V11, V12, V13, V14 and V22 (all OD side) with no relevant indications noted (NRI's). Examined 70% weld V23 (OD side) (NRI's). There was no OD side access to welds V7, V8, V30 and V31. Also, there was no ID side access to welds V7, V8, V22 and V23. Technical Justification #TJ-076-04, defers UT inspection of several vertical welds to RFO16. Examined 100% vertical welds V32 and V33 in shroud support cylinder (all OD side) (NRI's). There was no access to vertical weld V34.
	RFO16, 2007	UT	Examined > 90% belt-line vertical welds V15, V16, V17 & V18 (NRI's)
		EVT-1	Examined 100% vertical welds V7 & V8 (NRI's). There was no OD side access to

			welds V30 & V31. Also, there was no access to shroud support weld V34. A deviation disposition will address the issue
		EVT-1/ VT-1/VT-3	Examined the accessible surfaces, contact points, seating surfaces, locking devices and critical contact areas for the four tie-rods per BWRVIP-76, industry OE's and repair vendor requirements. Replaced the upper supports at tie-rods 45° and 225° locations. Plans are to replace in RFO17 the remaining two upper supports at 135° and 315° (NRI's)
	RFO17, 2009	UT	V30 & V31 examined with GE TS^2 tool
		EVT-1	V9, V10, V11, V12, V13, V14 in top guide support ring examined; V22 examined in central mid-ring when 135 tie rod was removed/replaced.
	RFO19, 2013	EVT-1	Top guide ring segment welds V9, V10, V11, V12, V13 & V14
		EVT-1	Shroud vertical welds V7, V8 & V23
	RFO21, 2017	EVT-1	Examined V22 (OD) with NRI. Top Guide ring segment welds V9, V10, V11, V12, V13 & V14 (OD) with NRIs. BWRVIP Deviation Disposition DD 2-16-004 issued to defer V15, V16, V17 and V18.
Shroud Tie Rods	RFO10	EVT-1/ VT-1/VT-3	Installed 4 tie rods as pre-emptive repair for shroud horizontal welds
	RFO16, 2007	EVT-1/ VT-1/VT-3	Replaced upper supports at 45° and 225° tie rods due to Plant Hatch event. Examined the accessible surfaces, contact points, seating surfaces, locking devices and critical contact areas at all 4 tie rods per BWRVIP-76, industry OE's and repair vendor requirements.

	RFO17, 2009	EVT-1/ VT-1/VT-3	Replaced entire tie rod at 135° due to stuck nut and upper support only at 315°. Performed re-inspection of 45° and 225° tie rods from RFO16 replacements. Examined the accessible surfaces, contact points, seating surfaces, locking devices and critical contact areas per BWRVIP-76, industry OE's and repair vendor requirements.
	RFO18, 2011	EVT-1/ VT-1/VT-3	Re-inspected the RFO17-replaced hardware at tie-rod locations 135° & 315° including entire 135 tie rod assembly and top assembly of 315 tie rod. Added remainder of 315 tie rod to inspection scope for scheduling efficiency purposes.
SHROUD SUPPORT Access Hole Covers	8 (UT), 9 (VT), 10 (UT radial of 0 degree cover), 10 VT of 180 degree cover)	UT	UT exam in RFO 8 was for circ. Cracking only. No indications. RFO 10 visual indication at 0 degree cover verified non-relevant by UT.
	RFO14	EVT-1	Examined at 0° and 180° (NRI's)
	RFO16, 2007	VT-1	Examined at 0° and 180° (NRI's)
	RFO19, 2013	EVT-1	Inspected access hole covers at 0 and 180 degrees.
	RFO20, 2015	UT	Inspected access hole cover at 0° (for both circ and radial flaws) with one fabrication-related indication noted. UT of AHC at 180° deferred to RFO21 due to vendor tooling issues.
	RFO21, 2017	EVT-1	Examined at 180° (NRI) in accordance with BWRVIP Deviation Disposition DD-2016-001.
Shroud Support Plate to RPV (H11) Weld	RFO10	EVT-1	Enhanced VT-1 RFO 10. No indications.
	RFO12	EVT-1	Examined 10 % of weld length with no indications.

	RFO15	EVT-1	Examined 16% of weld length (top side) (NRI's).
		VT-3	Examined 360° of weld length (top side) with NRI's.
	RFO17, 2009	EVT-1	Examined H10 and H11 between 128°-142° when 135° tie rod was removed/replaced.
	RFO18, 2011	EVT-1	Examined H11 at 0° & 180° between JPs 20 & 01 and JPs 10 & 11.
	RFO20, 2015		Examined 360° of weld length (top side) with NRI.
	RFO21, 2017	EVT-1	Examined H11 (top side) at 0° & 180° between JPs 20 & 01 and JPs 10 & 11 for BWRVIP-38 10% requirement (NRI).
Shroud Support Plate Gusset Welds	RFO10	EVT-1/ VT-1	Enhanced VT-1 RFO 10 of 4 gussets (modification attach. Points), VT-1 all others (18).
	RFO11	EVT-1	No indications. RFO 11 EVT-1 of gusset at 315 az.
	RFO12	EVT-1	Examined gusset welds at 225,135, 45, 15 and 345 degrees with no indications.
	RFO14	EVT-1	Examined gusset welds at 75, 165,195, 255,and 300 degrees.
	RFO15	EVT-1	Examined all gusset welds at 30°, 120° and 240° (NRI's).
		VT-3	Examined gusset-to-RPV welds at 30°, 60°, 90°, 105°, 120°, 150°, 210°, 240°, 270°, 285° and 330° (NRI's).
	RFO16, 2007	EVT-1	Examined gusset welds at 45°, 135°, 225° and 315° (NRI's)
	RFO17, 2009	EVT-1	6 gussets at 15°, 60°, 90°, 135°, 270° & 315° examined.

	RFO18, 2011	EVT-1	4 gussets at 135°, 165°, 315° & 345° examined.
	RFO19, 2013	EVT-1	6 gussets at 45°, 195°, 210°, 225°, 300°, 330°.
	RFO20, 2015	EVT-1	5 Gussets at 30°, 75°, 105°, 150° & 255°
		VT-3	Examined 22 gussets (360°)
CORE SPRAY PIPING	RFO6, 7, 8, 9, 10, 11	UT/EVT-1	3" long indications recorded previously in 1980, 81 and 84 on 'B' sparger between T-Box and B-25 nozzle. RFO 7 and 8 exams show no indications. GE suspected scale as possible source of previous indications. RFO 11 UT revealed six cracked piping welds
	RFO12	EVT-1 and UT	EVT-1 of welds examined by EVT-1 in RFO 11 revealed no indications. UT of the four P8b welds with indications from RFO 11 revealed the indications to be geometric reflectors. All P9 welds were examined by UT with no indications. UT of 1P5 and 3P5 , which had indications in RFO 11, revealed slight growth in the indication in 1P5.
	RFO13	EVT-1	Examined all target welds excluding those with RFO 12 ultrasonic results (no indications)
	RFO14	EVT-1	Examined target welds, no indications, one weld at lower, one mil, sensitivity.
	RFO15	EVT-1	Examined all creviced and tee box-to-pipe welds; and 25% rotating sample of pipe elbow welds (NRI's)
		EVT-1/ VT-3	Examined all piping brackets (4 total) support welds (NRI's)
	RFO16, 2007	EVT-1	Examined all creviced and tee box-to-pipe welds; and 25% rotating sample of pipe elbow welds (NRI's)

	RFO17, 2009	UT	Examined 1P5 & 3P5 piping welds with pole-mounted GE CSI UT tool; previous indications from 1999 were determined to be geometry.
		EVT-1	P1A, P2A, 1P3, 1P6, 1P7, 1P8a, 1P8b, 2P3, 2P4a, 2P4b, 2P5, 2P6, 2P7, 2P8a, 2P8b, P1B, P2B, 3P3, 3P4a, 3P4b, 3P6, 3P7, 3P8a, 3P8b, 4P3, 4P5, 4P6, 4P7, 4P8a, 4P8b examined.
	RFO18, 2011	EVT-1	P1A, P1B, P2A, P2B, 1P3, 2P3, 3P3, 4P3, 2P5, 4P5, 1P6, 2P6, 3P6, 4P6, 1P7, 2P7, 3P7, 4P7, 1P8a, 2P8a,3P8a, 4P8a, 1P8b, 2P8b, 3P8b, 4P8b, 1P4a, 4P4a, 1P4b, 4P4b examined.
	RFO19, 2013	EVT-1	CS piping welds P1A, P1B, P2A, P2B, 1P3, 2P3, 3P3, 4P3, 1P5, 2P5, 3P5, 4P5, 1P6, 2P6, 3P6, 4P6, 1P7, 2P7, 3P7, 4P7, 1P8a, 2P8a, 3P8a, 4P8a, 1P8b, 2P8b, 3P8b, 4P8b, 1P4c, 2P4c, 3P4c, 4P4c.
		EVT-1/ VT-3	CS piping brackets 1PB, 2PB, 3PB, 4PB
	RFO20, 2015	EVT-1	CS piping welds P1A, P1B, P2A, P2B, 1P3, 2P3, 3P3, 4P3, 1P5, 2P5, 3P5, 4P5, 1P6, 2P6, 3P6, 4P6, 1P7, 2P7, 3P7, 4P7, 1P8a, 2P8a, 3P8a, 4P8a, 1P8b, 2P8b, 3P8b, 4P8b and non-creviced 1P4d, 2P4d, 3P4d, 4P4d welds.
CORE SPRAY SPARGER	RFO13	EVT-1	All S1, S2, and S4 welds.
		VT-1	All SB and 50% of the S3 welds, these were the upper sparger (no indications).
	RFO15	EVT-1	All S1, S2, and S4 welds.
		VT-1	All SB and 50% of S3a,b welds; these are the lower spargers (NRI's). No S3c (drains) were found.
	RFO17, 2009	EVT-1	All S1, S2, and S4 welds.
		VT-1	S3a & S3b at 'A'(15°) & 'C' (165°) upper

			spargers examined. No S3c (drains) were found.
		VT-1	SB sparger brackets examined at all 4 spargers
	RFO19, 2013	EVT-1	All S1, S2 & S4 major welds
		VT-1	S3a, S3b, S3c nozzle welds on lower spargers (B & D only)
		VT-1	All SB sparger brackets
TOP GUIDE (RIM, etc.)	RFO6, 7, 8, 9		Partial exams each outage. Some scratches, wear marks; no cracking found.
TOP GUIDE ALIGNER ASSEMBLY	RFO12	VT-1	Examination of assemblies at 0 and 90 degrees revealed no indications
TOP GUIDE GRID BEAMS	RFO16	VT-1	Examined accessible surfaces of grid beams at six cell locations (most at high fluence areas) (NRI's)
	RFO18, 2011	EVT-1	Examined 8 cells at locations 22-23, 26-23, 30-23, 30-27, 30-31, 34- 23, 34-19 & 22-35 using GE automated TGIT tool.
	RFO21, 2017	EVT-1	Examined 8 cells at locations 22-31, 26-23, 30-23, 30-27, 30-31, 42-19, 34-35 & 22-35 using GEH automated TGIT tool with NRI.
CORE PLATE (RIM, etc.)	RF01	N/A	Installed 104 core support plate plugs (1974)
	RFO11	N/A	Replaced all 104 core support plate plugs (1997)
	RFO16, 2007	VT-3	Examined all core plate wedges at 45°, 135°, 225° and 315° (NRI's)
	RFO21, 2017	VT-3	Examined all 8 core plate wedges at 45°, 135°, 225° and 315° (NRI).
SLC	RFO13	VT-2	System Leakage Test (no leaks)
	RFO14	VT-2	System Leakage Test, insulation removed, no indications.

	RFO15	PT	Examined by PT. Exam was "accepted, no indications noted".
		EVT-2	System Leakage Test, insulation removed, no leaks detected.
	RFO16, 2007	EVT-2	System Leakage Test (no leaks)
	RFO18, 2011	UT	Examined RPV-N14-1 safe end weld and entire safe end extension with GE manual phased array UT per BWRVIP-27A.
		EVT-2	Enhanced System Leakage Test, insulation removed, no leaks detected.
	RFO19, 2013	EVT-2	Enhanced System Leakage Test, insulation removed, no leaks detected.
	RFO20, 2015	EVT-2	Enhanced System Leakage Test, insulation removed, no leaks detected.
JET PUMP ASSEMBLY Jet Pump Riser Braces	RFO 8, 10, 11	VT-1	No indications. RFO 10 100% done. Do 50% each RFO per OE item. RFO 11 VT-1 of braces 5 through 14 (50%).
	RFO 12	EVT-1	All Riser Braces were examined at RB-1 and RB-2 except for Jet Pump 3 and 5. No indications were found.
	RFO 13	EVT-1	All RB 1a,b & 2 a, b for Risers A,B,C,D,E,H and J(no indications)
	RFO 14	EVT-1	Riser braces for pumps 1,2,8,9,10,12,13,14,16,17 and 20.No indications
	RFO16, 2007	EVT-1	Examined RB-1a,b and RB-2a,b welds at JP #17/18 (NRI's)
	RFO18, 2011	EVT-1	Examined RB-1a,b and RB-2a,b welds at JPs 1, 2, 3, 4 & 5
	RFO20, 2015	EVT-1	Examined RB-1a,b and RB-2a,b welds at JPs 11, 12, 13,14,15,16,19 & 20
Jet Pump Sensing Lines	RFO 7, 8, 9	VT-3/VT-1	No indications.

	RFO17, 2009	VT-3/VT-1	JPs 1 thru 10; sensing lines and bracket supports per SIL 420 R1
	RFO18, 2011	UT	JPs 11 thru 20; sensing lines and bracket supports per SIL 420 R1
Jet Pump Beam Assemblies	Replaced RFO 6, RFO 11 (UT, VT)	UT	RFO 11 (UT of 100%; VT of Jet Pumps 5 through 14)
	RFO 12	UT	All beams examined at BB-1 and BB-2 with no indications
	RFO16, 2007	UT	Examined all twenty beams at BB-1, BB-2 and BB-3 (NRI's)
		EVT-1	Examined beam at JP# 7 (NRI's)
	RFO21, 2017	EVT-1	Examined twenty beams per BWRVIP Deviation Disposition DD-2016-002 (NRI).
Jet Pump Adjusting Screws	RFO 8, 10, 11	VT	No indications RFO 8. Gaps found RFO 10, minor mech. Damage. Inspection tied to Rise Brace cracking. RFO 11 VT of 100% of screws.
	RFO 12	VT	Gaps were measured for in all pumps except for 5,6,7 and 11
	RFO 13	VT-3	Gaps were measured for on pumps 1,4,6,7,8,9,16, and 17 (no change)
	RFO16, 2007	VT-1/VT-3	Examined the "as found/as left" set screw gap measurements for aux wedge installations at JP #01, 02, 8, 9, 11, 17 & 20, including the aux wedge addition (NRI's)
	RFO17, 2009	VT-1/VT-3	Re-inspected aux wedges (WD-1) installed in RFO16 at JPs 01, 02, 8, 9, 11, 17 & 20 (NRI's)

Jet Pump Restrainer Bracket and Swing Gate Assemblies	RFO 11	VT-3	RFO 11 VT-3 of 100% of swing gates, wedges and screws. Found 10 out of 20 swing gates in unlatched position.
	RFO 12	VT-3	Inspected all Swing Gate assemblies except for 5 and 11
	RFO 13	VT-3	Inspected assemblies for pumps 1,4,6,7,8,9,16,and 17(no indications)
		VT-3	Examined WD-1 on pumps 1 to 10 (no indications)
	RFO 15	VT-1	Examined WD-1 restrainer wedges on jet pumps #1, 2, 4, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 19 and 20, with relevant indications noted only on JP-16 and JP-17. Examined RK-1, RK-2 and RK-3 at jet pumps #16 and #17 (NRI's).
	RFO16, 2007	VT-1	Examined WD-1 restrainer wedges at JP's #3, 5, 11 & 18. Recordable indications were identified on the wedge handle at JP's # 5 & 11. These were satisfactorily dispositioned-Re-inspect in RFO-17
			Examined RK-1, 2 & 3 welds at JP#17 (NRI's)
		VT-3/VT-1	Examined "as found/as left" of existing/replaced swing gates and wedges at JP's #01, 4, 6, 7, 8, 9, 16 & 17 (NRI's)
	RFO17, 2009	VT-3/VT-1	Re-inspected swing gates replaced in RFO16 at JPs 1, 4, 6, 7, 8, 9, 16 & 17 (NRI's)
		VT-1	Re-inspected wedges (WD-1) replaced in RFO16 at JPs 1, 4, 6, 7, 8, 9, 16 & 17 (NRI's). Also examined wedges (WD-1) and bent wedge handles (re-examined) at JPs 5 & 11.
	RFO18, 2011	VT-1	Inspected wedges (WD-1) at JPs 2, 3, 10, 12, 13, 14, 18, 19 & 20

	RFO19, 2013	VT-1	Inspected wedges at JPs 4, 5, 15 & 16
	RFO21, 2017	VT-1	Bent wedge handles re-examined at JPs 5 & 11 (no changes detected).
Jet Pump Mechanical Joints	RFO 11	VT-1	RFO 11 VT-3 of 50% of Jet Pumps (Jet Pumps 5 through 14) of rams head-to-transition piece and lower slip joint-to-diffuser areas
	RFO 12	VT-3	Inlet mixer to diffuser for 1 to 4 and 15 to 20
	RFO 13	VT-3	Examined rams head to transition piece and lower slip joint to diffuser areas for pumps 1,4,6,7,8,9,16, and 17 (no indications)
	RFO16, 2007	VT-3	Examined slip joint at JP #17 (NRI's)
	RFO19, 2013	VT-3	Inspected for wear or leakage at inlet mixer-to-diffuser slip joints at JPs 1, 5, 6, 11, 15, 16
Jet Pump Riser Welds	RFO 11	EVT-1	All RS-1 and RS-2 examined with no indications
	RFO 12	EVT-1	RS-3 of risers A to E examined with no indications.
	RFO 13	EVT-1	Examined RS-4, RS-5, RS-8 and RS-9 for risers A,B,C,D and E (no indications)
	RFO 14	EVT-1	RS-3 of risers F to K no indications
	RFO16, 2007	EVT-1	Examined the following JP riser welds with NRI's: RS-1, RS-2 and RS-3 at JP's 5/6 RS-4 and RS-5 at JP's 15/16 RS-8 and RS-9 at JP's 13/14 & 15/16
	RFO17, 2009	EVT-1	Examined RS-1, RS-2 & RS-3 welds at JPs 1/2, 3/4, 7/8 & 9/10 Examined RS-4 & RS-5 welds at JPs 11/12, 13/14, 17/18 & 19/20

			Examined RS-8 & RS-9 welds at JPs 11/12, 17/18 & 19/20. Also examined added scope RS-8 & 9 welds at JPs 5/6 & 15/16 due to Laguna Verde event.
	RFO18, 2011	EVT-1	Examined RS-1 & RS-2 welds at JPs F, G, H, J & K Examined RS-8 & RS-9 welds at JPs A, B, D, E & G Examined RB-1 & RB-2 welds at JPs 1, 2, 3, 4 & 5
	RFO19, 2013	EVT-1	Inspected 5 riser RS-3 welds on F, G, H, J & K risers
		EVT-1	Inspected RS-4 & RS-5 welds on A, B & C risers
		EVT-1	Inspected RB-1 & RB-2 welds at JPs 6, 7, 8, 9 & 10
		EVT-1	Inspected draw bead weld locations on C, E & G risers (Laguna Verde OE). NRI
Jet Pump Inlet, Mixer, and Diffuser Welds	RFO 13	VT-3	Examined IN-5 for pumps 1 to 10 (no indications)
		EVT-1	Examined MX-1 for pumps 1 to 10 (no indications)
		EVT-1 and UT	Examined MX-3, DF-1, DF-2, AD-3a, b, AD-1, AD-2 on pumps 13,14,15,16 and 17 by UT and pumps 11, 12, 18, 19 and 20 by EVT-1 (no indications)
	RFO 14	EVT-1	Examined AD-2,AD-1,DF-2, and AD-3a,b for pumps 1 to 10, no indications.
	RFO16, 2007	VT-3	Examined IN-5 at JP #15 & 16 (NRI's)
		EVT-1	Examined MX-1 at JP #15 & 16 (NRI's) Examined MX-3 and DF-1 at JP #5 & 6 (NRI's)

	RFO17, 2009	UT	Examined (JPIT) DF-2, DF-3, AD-1, AD-2, DF-1 & MX-3 welds at JPs 1-20.
		EVT-1	Examined MX-1 at JPs 11-14 & JPs 17-20. Also did MX-1 at JPs 8 & 9 due to 135° tie rod removal/replacement.
		VT-3	Examined IN-5 at JPs 11,12,13,14,17,18,19,20. Also did IN-5 at JPs 8 & 9 due to 135° tie rod removal/replacement.
	RFO19, 2013	VT-3	Inspected IN-5 inlet-to-mixer clamp bolting at JPs 1, 2, 3, 4, & 5. Found 2 cracked tack welds at JPs 3 & 4 (accept-as-is disposition)
	RFO20, 2015	VT-3	Re-inspected 2013 indications at IN-5 INLET-TO-MIXER clamp bolting at JPs 3 & 4. No change from previous detected.
		EVT-1	MX-1 and MX3 (barrel-side only) welds at JPs 1, 2, 3, 4 & 5. NRI DF-1 welds at JPs 1, 2, 3, 4 & 5. NRI DF-2, AD-1, AD-2 and AD-3a welds at JPs 1 thru 10. Pilgrim does not have an AD-3b weld. NRI
		VT-1	WD-1 wedges at JPs 5,6,7,11 & 17. NRI Re-inspected 7 Aux Wedges (clothespin-type) installed in RFO16, 2007 at JPs 1,2,8,9,11,17 & 20. NRI
	RFO21, 2017	VT-3	Re-inspected tack weld indications at IN-5 inlet-to-mixer clamp bolting at JPs 3 & 4. No change from previous detected.
GUIDE TUBE Handle Attachment	RFO 7		No indications
	RFO 13	N/A	FS/GT –ARPIN-1 at 8 locations
	RFO 14	VT-3/ EVT-1	CRGT1, 2 and 3 for 8 tubes, no indications
	RFO16, 2007	VT-3/ EVT-1	Examined FS/GT-ARPIN-1, CRGT-1, 2 & 3 at 2 tubes (NRI's)

	RFO17, 2009	EVT-1/ VT-3	CRGT-1, CRGT-2, CRGT-3 & FS/GT-ARPIN-1 examined at cells 50-27, 50-31, 50-39, 46-39 & 46-31.
	RFO20, 2015	VT-3	Cells 22-27 and 22-31 disassembled to install bottom head drain plug. Examined guide tubes from cells 22-27 and 22-31 in SFP after cell disassembly. Installed new guide tube at core cell location 22-31 due to installation issues.
CRD STUB TUBE	RFO 7		No indications
	RFO16, 2007	VT-3	Examined accessible surfaces in lower plenum at several locations (NRI's)
	RFO20, 2015	VT-3	Cells 22-27 and 22-31 disassembled to install bottom head drain plug.
IN-CORE HOUSING	RFO16, 2007	VT-3	Examined accessible surfaces in lower plenum at several locations (NRI's)
	RFO20, 2015	VT-3	Cells 22-27 and 22-31 disassembled to install bottom head drain plug.
DRY TUBES	RFO16, 2007	VT-1	Examined 4 (four) dry tubes per SIL-409, Rev 2 requirements (NRI's)
	RFO17, 2009	VT-1/VT-3	Replaced 6 dry tubes; performed PWT as-left exams of new dry tubes at SRM 12-25, IRMs 12-41, 20-25, 28-25, 36-09 & 36-41.
	RFO 19	VT-1/VT-3	Replaced 3 dry tubes; performed PWT as-left exams of new dry tubes at IRMs (H) 12-09, (C) 20-33 & (D) 28-33.
	RFO20, 2015	VT-1/VT-3	Inspected 3 dry tubes at SRMs A, B & C with NRI
INSTRUMENT PENETRATIONS N15 & N16 partial penetration nozzles	RFO 15	EVT-2	Enhanced system leakage test (insulation removed); no leakage detected)
	RFO16, 2007	EVT-2	Enhanced system leakage test (insulation removed); no leakage detected)
	RFO17, 2009	EVT-2	Enhanced system leakage test (insulation removed); no leakage detected)

	RFO18, 2011	EVT-2	Enhanced system leakage test (insulation removed); no leakage detected)
VESSEL ID BRACKETS	RFO 10		3 locations. No indications
Surveillance Specimen Brackets Attachment Welds	RFO 15	VT-1/VT-3	Examined attachment welds at all 3 locations (NRI's). Re-engaged the lower end of sample holder at 210° back to the proper location (CR-PNP-2005-02137).
	RFO17, 2009	VT-3	Re-examined surveillance sample holder lower bracket at 210° found dis-lodged in 2005 (NRI).
	RFO19, 2013	VT-1/VT-3	Inspected surveillance sample holder upper & lower brackets at 120, 210 & 300 degrees
Feedwater Bracket Attachment Weld	RFO 14	VT-3/ EVT-1	Code and BWRVIP examination of all attachments
	RFO18, 2011	VT-3/VT-1	Code and BWRVIP examination of all FW bracket attachment welds.
Guide Rod Bracket Attachment Welds	RFO 10, 11 (180 az guide rod)		No indications
	RFO 15	VT-3	Examined guide rod attachment welds at 0° and 180°. No relevant indications noted.
	RFO19, 2013	VT-3	Inspected guide rod attachment welds to RPV, brackets and assemblies at 0° & 180°
Steam Dryer Support Bracket	RFO 7, 8, 9, 10, 11		No Indications
	RFO 15	VT-3/ EVT-1	Examined support bracket attachment welds at all four locations (NRI's).
	RFO19, 2013	EVT-1 & VT-3	Inspected all 4 support lugs

Steam Dryer Hold-Down Bracket Welds (on head)	RFO 10		Located underside of RPV head No indications
	RFO 15	VT-3	Examined hold-down bracket attachment welds at all four locations (NRI's).
	RFO20, 2015	VT-3	Examined hold-down bracket attachment welds at all four locations (NRI's).
Abandoned Start-up Instrumentation Brackets	RFO 11	VT-1	Brackets welded to RPV wall at 90 and 150 az received VT-1 in RFO 11
	RFO17, 2009	VT-1	Bracket at 150° cut back (EDM) to remove interference for future N1B nozzle plug installation.
STEAM DRYER Steam Dryer Drain Channels	RFO 8, 9, 11	VT-3	No indications
	RFO 12	VT-3	No indications
	RFO16, 2007	VT-1	No indications
Steam Dryer Leveling Screws	RFO 7, 8, 9, 10, 11	VT-3	Cracked tack welds RFO 7; no growth observed in 8, 9 and 10. RFO 11 VT showed increased cracking of tack welds at 35 and 215 degree leveling screws, with 215 az screw loose.
	RFO 12	VT-3	No change from RFO 11
	RFO 13	VT-3	No change from RFO 12
	RFO 14	VT-3	Change in cracks
	RFO 15	VT-1	Examined leveling screws at 35°, 145°, 215° and 325°. There was no change in tack weld cracks at 35° and 215° and NRI's at 145° and 325°
	RFO16, 2007	VT-1	Examined leveling screws at 35°, 145°, 215° and 325°. There was no noticeable change in tack weld cracks at 35° and 215° and NRI's at 145° and 325°
	RFO17, 2009	VT-1 (1989)	Examined leveling screws and lifting lugs at 35°, 145°, 215° and 325°. No noticeable change in tack weld cracks at

			35° and 215° and NRI's at 145° and 325°
	RFO18, 2011	VT-1 (1989)	Examined leveling screws and lifting lugs at 35°, 145°, 215° and 325°. No noticeable change in tack weld cracks at 35° and 215° and NRI's at 145° and 325°
	RFO19, 2013	VT-1/VT-3 (1989)	Inspected level screws (4) and lifting lug assemblies (4) – w/VT-1 (89) of lifting lug and VT-3 (89) of lugs.
		VT-1 (1989)	Re-inspected steam dryer level screw tack weld cracks at 35° & 215°. No change.
		VT-1 (1989)	Re-inspected linear indication on steam dryer divider plate anchor #5 weld. No change.
		VT-1 (1989)	Inspected fillet welds at two startup vibration instrumentation clamp blocks on center hood outer top surface. NRI
	RFO20, 2015	VT-1/VT-3 (1989)	Inspected level screws (4) and lifting lug assemblies (4) - w/ VT-1(89) of lifting lug welds and VT-3(89) of lugs.
		VT-1 (1989)	Re-inspected steam dryer level screw tack weld cracks at 35° & 215°. No change.
	RFO21, 2017	VT-1/VT-3 (1989)	Inspected level screws (4) and lifting lug assemblies (4) - w/ VT-1(89) of lifting lug welds and VT-3(89) of lugs.
		VT-1 (1989)	Re-inspected steam dryer level screw tack weld cracks at 35° & 215°. No change.
Steam Dryer Baffle Plate	RFO 7, 11	VT-3	No indications.
Steam Dryer Integrity	RFO 14	VT-1	SIL 644

	RFO 15	VT-1	Examined steam dryer integrity per SIL 644, Rev. 1 guidelines on OD side above dryer supporting ring. Examination included all vertical welds, horizontal welds at end banks and end welds at all ten tie-bars. Relevant indications were noted at an end weld of each tie-bar #3, 4, 5 and 9 (CR-PNP-2005-01608). A total of seven tie-bars were replaced and further examined to establish inspection baseline. These are #1, 2, 3, 4, 5, 9 and 10.
	RFO16, 2007	VT-1/VT-3	Completed steam dryer integrity examinations per requirements of BWRVIP-139 (this included ID and OD side). Examined welds on the original and replaced (RFO 15) tie-bars; guide channels; guide followers; upper support ring; internal Hood A and E horizontal and vertical welds and internal drain channels Relevant indications were found on the ID side of the dryer at vane Bank E weld and in the weld at divider plate anchor #5 between Bank C and D. Indications were satisfactorily dispositioned (Plan to re-inspect again the indication in the divider plate anchor) Examined all four lifting rod assemblies and attachment welds (NRI's)
	RFO17, 2009	VT-1 (1989)	Examined hood welds HA-6, HA-8 & HA-10 from the ID surface (air bubbles removed) Re-examined linear indication on steam dryer divider plate anchor #5 weld (no change from RFO16)
	RFO18, 2011	VT-1 (1989)	Re-examined linear indication on steam dryer divider plate anchor #5 weld (no change from RFO17)
	RFO20, 2015	VT-1 (1989)	Examined steam dryer integrity OD welds per BWRVIP-139-A guidelines.

			Examination included all RED welds and a >10% sample of GREEN welds. Tie bar #8 was found to be cracked; the condition was accepted as-is for one cycle.
	RFO21, 2017	VT-1 (1989)	Re-inspected tie bar #8 indication and adjacent similar tie bars # 6 & 7. Indication detected in tie bar #6 (accepted for one additional cycle per GEH evaluation). Steam dryer integrity ID weld exams per BWRVIP-139-A guidelines deferred per BWRVIP Deviation Disposition DD-2016-003.
MOISTURE SEPARATOR	RFO16, 2007	VT-3	Examined all four lifting rod assemblies and guide pins at two locations (NRI's)
	RFO17, 2009	VT-1 (1989)	Examined 4 upper and 4 mid-support ring gusset locations (NRI)
		VT-1 (1989)	Performed overview of separator tie straps
	RFO18, 2011	VT-1/VT-3 (1989)	Inspected all 4 separator lifting lug assemblies (VT-1) and guide pins (VT-3). Cracking found on all 4 lifting lugs (lug azimuths in order of cracking severity: 008°, 300°, 188° & 120°). JCO developed allowing 2 additional cycles of operation. Repair planned for next outage (RFO19). Mechanical damage found at 180° guide lug determined to be preexisting.
	RFO19, 2013	VT-1/VT-3 (1989)	Lifting lug assemblies at 008°, 300°, 188° & 120°. No changes noted in RFO18 indications.
		VT-1/VT-3 (1989)	Inspected both separator guide pin assemblies at 0° & 180°
		VT-1 (1989)	Inspected 8 (4 upper and 4 mid-support ring) gussets for cracking at 008°, 300°, 188° & 120° azimuths

		VT-3 (1989)	Inspected balance of all upper and mid-support ring gussets for damage (excluding 8 gussets examined by VT-1 above)
		VT-3 (1989)	Performed overview inspection of accessible separator standpipes and tie bars
	RFO20, 2015	VT-1/VT-3 (1989)	Lifting lug assemblies at 008°, 300°, 188° & 120°. No changes noted in RFO18 indications.
		VT-3 (1989)	Inspected both separator guide pin assemblies at 0°& 180°
	RFO21, 2017	VT-1/VT-3 (1989)	Lifting lug assemblies at 008°, 300°, 188° & 120°.
		VT-3 (1989)	Inspected both separator guide pin assemblies at 0°& 180°
		VT-1 (1989)	Re-inspected RFO18 indications in lifting lug assemblies at 008°, 300°, 188° & 120° as required by RFO18 GEH evaluation. No changes noted.
LPCI COUPLING	N/A	N/A	N/A
FEEDWATER SPARGERS	RFO 6, 7, 8, 9, 10		No indications.
	RFO 14	VT-3/VT-1	All spargers, no indications
	RFO18, 2011	VT-1	Flow holes and welds in sparger arms, tees and end caps at Spargers "A", "B", "C" & "D".
		VT-3	Sparger piping, end brackets & pins at Spargers "A", "B", "C" & "D"
		VT-3/ EVT-1	Bracket integral attachment welds to RPV (8 places) at Spargers "A", "B", "C" & "D"
FW Sparger End Brackets/pins	RFO17, 2009	VT-1	Examined all 8 brackets and pins (NRI)

BWRVIP-75-A DISSIMILAR METAL WELDS Category D	RF0 14	UT (Manual)	JPI nozzle safe end weld RPV-N9B-1
	RFO 15	UT (Auto)	Recirculation inlet nozzle safe end welds 2R-N2D-1, 2R-N2E-1, 2R-N2F-1, 2R-N2G-1 & 2R-N2J-1. Recirculation outlet nozzle safe end weld 2R-N1B-1. Core Spray nozzle welds 14-A-1, 14-B-1, 14-A-3, 14-B-3.
		UT (Manual)	Core Spray piping welds 14-A-10A & 14-B-10A
	RFO16, 2007	UT (Auto)	Recirculation inlet nozzle safe end welds 2R-N2H-1, 2R-N2K-1 & 2RN2F-1. Indication detected in N2K weld, repaired by overlay. Scope expansion included welds 2R-N2A-1, 2R-N2B-1 & 2R-N2C-1.
	RFO18, 2011	UT (Manual)	JPI nozzle safe end weld RPV-N9B-1
		UT (Auto PA)	Core Spray nozzle welds 14-A-1, 14-B-1, 14-A-3, 14-B-3. Recirculation inlet nozzle safe end weld 2R-N2G-1.
		UT (Manual PA)	Core Spray piping welds 14-A-10A & 14-B-10A.
	RFO19, 2013	UT (Manual PA)	Recirculation inlet nozzle safe end welds 2R-N2D-1 and 2R-N2E-1.
		UT (Manual PA)	JPI nozzle safe end weld RPV-N9B-1.
	RFO20, 2015	UT (Auto PA)	Recirculation inlet nozzle safe end welds 2R-N2F-1 & 2R-N2J-1. Recirculation outlet nozzle safe end weld 2R-N1B-1.

			Instrumentation nozzle weld RPV-N16B-R-2.
	RFO21, 2017	UT (manual PA)	Core Spray N6 nozzle welds 14-A-1, 14-B-1, 14-A-3 &14-B-3. Core Spray piping welds 14-A-10A & 14-B-10A. Recirculation inlet N2 nozzle safe end welds 2R-N2A-1, 2R-N2B-1, 2R-N2C-1, 2R-N2G-1 & 2R-N2H-1.
BWRVIP-75-A DISSIMILAR METAL WELDS Category E	RFO17, 2009	UT (manual)	RPV-N9A-1 - Existing JPI N9A nozzle safe end weld overlay was re-overlaid in RFO17 to make it inspectable under Supplement 11. Weld had been previously overlaid in 1984 to repair two indications in HAZ of safe end weld. No indications reported in 2009 exam.
		UT (manual)	3-I-1R - Capped N10 CRD return nozzle safe end weld was overlaid in 2003 to repair through-wall leak. No indications reported in 2009 exam.
	RFO19, 2013	UT (Manual PA)	Recirculation inlet nozzle safe end weld overlay 2R-N2K-IR
	RFO20, 2015	UT (manual PA)	JPI nozzle safe end weld RPV-N9A-1R

Reactor Internals Inspection History

Plant: **Quad Cities Unit 1**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud (BWRVIP-76)	04/94	EVT-1 and UT	Inspections per SIL 572, indications in circumferential welds.
	03/96	EVT-1 and UT	Inspections per BWRVIP Guidelines of all Shroud repair design reliant hardware prior to installation of comprehensive repair (4 GE designed tie-rod assemblies). Inspection of shroud consisted of EVT-1 of all ring segment welds (accessible surfaces), EVT-1 of vertical welds between H1 & H2 OD surface 100% (ID not accessible), UT of all 6 beltline vertical welds >30% length/weld, and EVT-1 of vertical welds between H6 & H7 OD surface >25% length/weld (ID not accessible).
	11/98	VT-1	No Reportable Indications.
	10/00	UT	Future inspections to be in accordance with BWRVIP-76; Reinspection of Repaired Core Shrouds. Shroud repair hardware inspected per GE recommendations. No Reportable Indications. Inspected shroud vertical welds V-14 through V-19, inclusive, in accordance with BWRVIP-76. One recordable indication on V-19 was acceptable to EOI under BWRVIP-76.
	11/02	EVT-1	6 vertical welds from the OD per BWRVIP-76. No indications. The steam dam above the shroud flange had impact damage evaluated as acceptable as-is for indefinite continued operation.

	04/05	EVT-1	Examined Ring Segment Welds V1-V4 (Shroud Head RSWs), V8-V13 (Top Guide RSWs), and V20-V25 (Core Plate Support RSWs). NRI, but indications notes in HAZ of shroud horizontal weld H-05-OD near core plate support RSWs. (Horizontal welds structurally replaced by shroud tie rod repair). Examined three shroud vertical welds Inaccessible for UT Inspection to gain additional coverage (V17, V18, and V19). NRI
	05/07	EVT-1	Examined 6 vertical welds from the OD (V-05, V-06, V-07, V-26, V-27, and V-28). NRI
	05/09	UT	Examined all 11 vertical welds accessible for UT. One weld behind tie rod support not accessible. One IGSCC indication 1.8" long identified in V19 HAZ.
	05/11	EVT-1	Examined 16 ring segment vertical welds (V1, V2, V3, V4, V8, V9, V10, V11, V12, V13, V20, V21, V22, V23, V24, and V25) per BWRVIP-76-A requirements. No reportable indications noted.
	03/13	EVT-1	Follow-up EVT-1 on V7 weld that is inaccessible for UT due to a Tie Rod. NRI Examined V-29, 30, 31, and 32; these are the vertical welds below H-7. This was a first time exam. Note - the welds are ground and polished, and therefore not visible. Due to interferences, the EVT-1 coverage determined to be 0% based on angle/distance, however, we inspected at the locations shown on the original fabrication drawings to a best effort visual exam. NRI
	03/15	EVT-1	Re-inspected V6 due to past history of low UT coverage with NRI.

			Attempted to inspect V29-32 (vertical welds below H7) with 0% EVT-1 for the second time-see Q1R22 entry. NRI with best effort.
Shroud Repair Hardware (BWRVIP Letters 2006-112 and 2006-220)	05/07	EVT-1, VT-3	EVT-1 of all tie rod upper support vertical faces, VT-3 of high-stressed fasteners and other contact points, and overall VT-3 per BWRVIP Letters 2006-112 and 2006-220. Also, VT-3 of core plate wedges adjacent to repair hardware. No reportable indications.
	03/13	EVT-1	Examined the Shroud Tie Rod Repair Upper Support radius bend area. NRI.
	04/17	EVT-1, VT-3	Inspected the four (4) Shroud Tie Rods. EVT-1 of all tie rod upper support vertical faces, VT-3 of high-stressed fasteners, other contact points, and overall condition per BWRVIP Letters 2006-112 and 2006-220. Also, VT-3 of core plate wedges adjacent to repair hardware. Minor movement related wear was noted at the Tie Rod Mid-Support Shroud side latch pins at 110°, 200° and 290°. This wear was evaluated as acceptable for continued operation. See Core Plate section for wedge inspection data.
Shroud Support (BWRVIP-38)	3/96	EVT-1	EVT-1 of H8 and H9 for approx 12" at 4 locations of shroud repair hardware attachment areas. Access hole covers; VT/UT in 1992, circumferential indications observed, permanent repair installed.
	10/00	EVT-1	Inspected H8 and H9 adjacent to AHC at JP# 10 & 11 in accordance with BWRVIP-38. No reportable indications.
	03/05	EVT-1	Inspected H8 and H9 adjacent to JP# 7 & 20 from annulus top side. Also inspected H8 and H9 adjacent to JP# 7 & 20 from bottom side through disassembled jet pumps.

	05/07	N/A	No inspections performed.
	05/09	N/A	No inspections performed.
	05/11	EVT-1	Inspected H8 and H9 welds accessible areas from the Annulus top side per BWRVIP-38 requirements. No reportable indications noted.
		VT-1	Performed examination of the mechanically repaired Access Hole Covers (AHC) at 335 ° and 155 °. No reportable indications noted.
	03/13	EVT-1, VT-3	Inspected Shroud Support Leg welds H-10 and H12 and Shroud Support Plate welds H-8 and H-9 in the Lower Plenum area near azimuth 222° via disassembled Jet Pump 14. Cleaning performed using a Hydrolazer at 2800 psig. NRI
	04/17	EVT-1	Completed top-side only EVT-1 exam of the accessible portion of the H8 and H9 welds with NRI. Inspection coverage was 100% of the accessible areas and 25% of the total weld lengths; inspection locations were near the AHCs at 335^0 and 155°.
Core Spray Piping (BWRVIP-18)	1980 to 1994	VT-1 (1 mil)	IEB 80-13/NUREG of piping and welds in annulus. Indication previously observed during 1994 on T-box was permanently repaired in 1996. Repair examined 11/98 with no reportable indications.
	04/96	EVT-1	EVT-1 performed to intent of BWRVIP-18 in 1996. Indications observed at two lower elbow welds, full structural margins on non-repaired welds. Future inspections per BWRVIP-18.
	11/98	Auto UT EVT-1	GE CSI-2000 with supplemental EVT-1 for unqualified welds (P8a & P4d). Identified one new flaw at P4d 110° downcomer similar to previously identified flaws at the P4d 260° & 290° downcomers. All flaws were evaluated

			for at least 48 months of operation with full structural margins without repairs. Previously identified flaws were determined to be of less extent than originally sized.
		EVT-1	Inspected P8a and P4d welds @ 4 downcomers in accordance with BWRVIP-18. Existing flaws at P4d welds at 110°, 260° and 290° downcomers showed no discernable change from 1998 inspection.
	10/00	UT	BWRVIP-18 UT examination of all accessible Welds (32). During the previous outage, indications were observed on welds 2P4D, 3P4D, and 4P4D (2 separate indications) and these were re-inspected this outage. A new indication was also observed on 3P4D that was not observed in the earlier outage. All were evaluated as acceptable for at least one cycle.
	11/02	EVT-1	BWRVIP-18 EVT-1 on 12 welds inaccessible to UT. Confirmed indications on welds identified by UT. No other indications. Re-inspected T-Box repair; no indications. The core spray piping bracket clamp at 125° was found loose. This condition was accepted as-is with a recommendation for reexamination.
		EVT-1	Lower Elbow to Shroud Pipe Welds 1P4d, 2P4d, 3P4d, 4P4d. NRI on 1P4d. No change in indications on 2P4d, 3P4d, 4P4d since last exam in 2002 (R17).Collar Weld to Shroud Pipe Welds 1P8a, 2P8a, 3P8a, 4P8a. NRI. Best effort on 4P8a. Separator lugs and tie rods limited views on lower half. Supplemental visual to disposition UT indication in base metal from R17. NRI
	03/05	VT-1, VT-3	Welds BP1, BP2, BP3, 2P2, 2P3, 3P3 at Tee Box repair (clamp interferes with

			EVT-1). NRI
		UT	UT Examination of 36 welds (32 welds in target set plus non-demonstrated exams on P8A welds). Sized previous indications on 2P4d, 3P4d and 4P4d with little or no change from previous. New indications on 2P4a and 4P4a that could not be confirmed visually.
	05/07	EVT-1	Inspected 16 P4 welds; four P8a welds; 3P6, 2p3 and 3P3, BP1 and BP2 at Tee Box repair; Tee Box repair clamp. Measured indications on 2P4d, 3P4d and 4P4d with no change from previous.
	05/09	EVT-1	Inspected 20 welds: 5 P4 welds with previous indications, 11 for which two-sided UT is not demonstrated (8 P8 and 3P4), and 4 that can only be inspected from one side due to repair clamp interferences (BP1, BP2, 2P3, 3P3). No new RI. No change in previous indications.
	05/11	EVT-1	Inspected 22 welds per BWRVIP-18 Rev 1: 1 P1, 1 P2, 4 P3, 4 P4a, 4 P4d, 4 P8a, 4 P8b. No coverage on 2P2 due to clamp. An INR documents no change in previous indications on 2P4d, 3P3, 3P4d, 4P4d; accept as-is. Examined all 8 Core Spray piping bracket vessel ID Attachment welds per BWRVIP-48-A and BWRVIP-18 Rev 1. NRI.
		VT-1/ VT-3	Examined repair Clamp at 185°. No reportable indications.
		UT	UT Examination of 34 welds: AP1, AP2, 1P3, 2P3, 4P3 and all four of P5, P6, P7, P8a and P8b. 15 for which two-sided UT is not demonstrated (8 P8, 3 P4, and 4 P3) and 2 that can only be inspected from one side due to repair clamp interferences

			(BP1, BP2). All 4 P4b for required 25% sample of P4 welds. Limited (one-sided) exams on all 4 P4d, and 2P4a and 4P4a. CNFs document no change in previous indications; accept as-is.
	03/13	EVT-1	Examined 19 welds; 1P2 (aka AP2), 4-P3, 4-P8a, 4-P8b, 4-P4d, 2P4a, and 4P4a. An INR documents no change in previous indications on 2P4d, 3P4d, and 4P4d; accept as-is; All other welds are NRI.
	03/15	EVT-1	Re-inspected 10 non-creviced P4 welds by EVT-1, including 3 welds that had been previously identified with indications (2P4d, 3P4d, and 4P4d). No new indications reported. The 2P4d and 3P4d indications showed no changes. The 4P4d weld showed an increase in indication length that was attributed to better inspection techniques; however, a review of the past outage exam recordings showed this extra length and no additional changes were noted. The 4P4d indications were found to extend into the seam weld along the bottom of the pipe about 0.106 inches. Also, re-inspected 28 creviced welds by EVT-1 with NRI.
		UT	Re-inspected all 16 P4 welds with UT. The original scope was to re-inspect 5 P4 welds with 8 known indications; but new indications and increased length of existing indications were found and scope expansion to the remaining 11 P4 welds was required. In summation: 2 additional welds with RI were identified this outage (for a total of 7 of the 16 P4 welds with indications) with 14 total indications in these 7 P4 welds. Per Loop numbers are: 1A loop has 8 indications spread over 4 P4 welds; 1B Loop has 6 indications spread over 3 P4 welds. Analysis was performed to justify 1-cycle of operation.

	04/17	N/A	Subsequent analysis of the P4 weld flaws was performed to justify 2-cycles of operation until 2019. Therefore, no follow-up exams were scheduled or completed in Q1R24 (2017).
		VT-1, VT-3	Reinspection of the Core Spray Tee-Box P3 weld repair hardware at 185° azimuth. NRI.
Core Spray Sparger (BWRVIP-18)	1980 to 1994	VT-1 (1 mil)	IEB 80-13 of welds on sparger. No indications found.
	04/96	EVT-1 or VT-3	EVT-1 performed to intent of BWRVIP-18, on T-box cover plate welds, T-box to sparger welds, end cap welds and bracket welds. VT-3 of spargers and nozzles. Future inspections per BWRVIP-18.
	11/98	EVT-1 MVT-1	End caps, cover plates and tee branch welds were EVT-1 examined. All sparger connections and bracket welds were MVT-1 examined. No reportable indications.
	11/02	EVT-1/ VT-1	EVT-1 Examined all 20 S1, S2, and S4 sparger welds. VT-1 50% of the S3a, b & c nozzle welds, and all 12 sparger brackets. Examined for IEB 80-13 and BWRVIP-18. No indications.
	03/05	N/A	No examinations performed.
	05/07	EVT-1	Examined all 20 S1, S2, and S4 sparger welds. No indications.
	05/09	N/A	No examinations performed.
	05/11	EVT-1/ VT-1	Examined 32 Sparger pipe and bracket welds and all Nozzles on all 4 lower spargers per BWRVIP-18, Rev 1. An INR documents no change in minor movement on the 190° Bracket; accept as-is.

	03/15	EVT-1/ VT-1	Inspected all S1, S2, S4 welds by EVT-1 with NRI. Inspected 4 S3a/b welds and 2 S3c welds by VT-1 with NRI. Inspected all 12 SB welds by VT-1 with NRI.
Top Guide (Rim, etc.) (BWRVIP-26, BWRVIP-183)	03/94	VT-1	VT-1 of 4 cells. No indications.
	04/96	VT-1	VT-1 of alignment assemblies. No indications.
	11/98	VT-1	VT-1 of alignment assemblies and adjacent rim welds. No reportable indications.
	10/00	EVT-1	Inspected accessible areas of location 11 in accordance with BWRVIP-26. No reportable indications.
	11/02	VT-3	Examined 9 pin welds (FS/GT-ARPIN-1) per BWRVIP-47. No Indications.
	03/05	EVT-1, VT-1	Alignment pin assemblies at 0° and 270°. NRI. EVT-1 of rim weld. Numerous machined holes identified in the horizontal plate adjacent to the rim weld similar to those found on Unit 2.
	05/07	N/A	No examinations performed.
	05/09	VT-1	Alignment pin assemblies at 90° and 180°. NRI.
		EVT-1	EVT-1 of accessible portions of rim weld. NRI. EVT-1 of 9 top guide grid cells (5%). NRI.
	03/13	EVT-1	EVT-1 of accessible portions of the TG Rim weld at 20 grid cell locations; cleaning performed using a Hydrolazer at 1200 psig. An INR documents Recordable Indications (RI) at 6 of the 20 cell locations; An Engineering Evaluation was performed to verify structural integrity remains intact for 2 cycles of operation. Therefore, accept as-is.

	03/15	EVT-1	Re-inspection by EVT-1 of all 20 accessible cells. Reconfirmed cracking in 6 cells from 2013, and identified 2 new cells with cracking. Currently, 8 of 20 cells are RI and 12/20 cells are NRI. Evaluation performed to justify 2-cycles of operation. Noted cracking on 270° aligner block during overview shot for Rim weld. Expanded scope to all 4 aligner assemblies with NRI on 2 blocks/pins (180° and 90°) and RI on 0° (around Pin upper weld) and 270° (in HAZ of left weld and across the face). Also, noted cracking in 4 support blocks near the aligner; these blocks are not shown on the design drawings and appear to be left over from original construction.
	04/17	EVT-1	Re-inspected all 4 aligner block assemblies and pins; new cracking was noted on the 180° and 90° assemblies. Additional cracking was noted on the 0° and 270° assemblies. The previous evaluation was re-confirmed as acceptable for 2-cycles of operation.
		EVT-1	Reinspected the 12 previously unflawed cell locations with EVT-1; NRI at these 12 cell locations. The previous evaluation was re-confirmed as acceptable for 2-cycles of operation.
		EVT-1	Completed the second set of 5% inspection scope of nine (9) grid beam cell locations with NRI. This was done 4 years early for outage management.
Core Plate (Rim, etc.) (BWRVIP-25)	N/A	N/A	Installed core plate wedges in conjunction with comprehensive shroud repair 1996.
	11/98	VT-1	Wedges inspected in conjunction with shroud repair hardware. No reportable indications.

	05/07	VT-3	Wedges inspected in conjunction with shroud repair hardware. No reportable indications.
	04/17	VT-3	Completed inspection of the four (4) Core Plate Repair Wedges in conjunction with shroud repair hardware exams. NRI, except the repair hardware at 200° showed a very fine gap (0.0001" to 0.0005") on the vertical surfaces between the wedge face and the core plate rim. Evaluated as acceptable for 1-cycle.
Jet Pump Assembly (BWRVIP-41)	03/94	VT-1	Hold down beams, beam bolt keepers, lock-plates and retainers; restrainer wedges, stops, and adjusting screws, clamp bolts and keepers; riser brace assemblies, adapter and baffle plate welds, sensing lines and sensing line brackets per various SILS. Latest inspections were in 1994. No reportable indications. Diffuser to baffle plate welds examined. No reportable indications.
	04/96	VT-1	Jet pump riser brace to riser weld at JP 5/6 repaired 1994, repair examined 1996 and 1998, no changes noted. Diffuser to baffle plate welds examined. No reportable indications.
	04/96	UT	One jet pump beam replaced 1986 due to indication. Jet pump beams are UT examined each outage using technique capable of detecting cracking at throat and ears. No subsequent indications.
	11/98	VT-1	Inspected all 20 jet pump assemblies. Identified indication at JP7/8 riser brace to riser weld. Repair installed 4/99.
	11/98	EVT-1	Inspected jet pump riser welds RS-1,-2 &-3. Visually identified 3 indications at JP 19/20 RS-1 weld. Subsequently sized indications with UT. The RS-1 weld was evaluated for at least 24 months of operation with full structural margin without repair.

	10/00	EVT-1	Inspected >50% of high priority welds (DF-2, AD-3a,b, AD-1 &AD-2) in accordance with BWRVIP-41. One recordable indication at JP-16 backing ring adjacent to AD-3a,b oriented axially across backing ring. Expanded sample to include 100% of AD-3a,b welds. Inspected BWR-3 beams at 16 jet pumps with UT (ends and center) in accordance with BWRVIP-41. No reportable indications. The RS-1 weld at JP 19/20 was permanently repaired.
	11/02	EVT-1	EVT-1 of DF-2, AD3-a&b, AD-1, AD-2 for all 20 jet pumps (except DF-2 on JP 11; EVT-1 of RB-1 and RB-2 of pumps 3, 4, 9, 10, 11, and 15-20; EVT-1 of risers on jet pumps 3/4, 9/10, 11/12, 15/16, 17/18, and 19/20; EVT-1 of MX-2, MX-3a&b, and MX-4 on pumps 4, 5, 9, 10, 11, 14/18 and 20; EVT-1 of MX-1 and DF-1 for pumps 6-11, 14-18 and 20; EVT-1 on the risers of pumps 3/ 4, 9/10, 11/12, 15/16, 17/18, and 19/20; VT-1 of AS-1 and AS-2 on pumps 5, 7, 8, and 20, VT-of wedges on jet pumps 16 and 20, VT-1 of clamp at RS-1 on jet pumps 19/10, and VT-3 of existing repair hardware at IN-5 on pumps 6-11, 14-17 and 20. One indication was found on JP 2 at AD-3b and two indications were found on JP 7 at AD-3b. Jet pump sensing line clamps were installed on 8 jet pumps (1, 2, 3, 10, 11, 12, 13, and 20).
	03/05	EVT-1	Risers: Six RS-1 welds, five RS-2 welds, and all ten RS-3 welds due to limited exams previously. Examined RS-4 and RS-5 on riser 11/12. Re-examined RB-1b on JP3, RB-2b on JP11 and RB-2a on JP 20. All NRI. Mixers: Examined MX-2 in JP 11 and 14. Examined MX-3a&b on 17 & 18. NRI.

			Diffuser/Adapter: Examined high priority welds, including 11 AD-1, 12 AD-2, 12 AD-3a,b, and 11 DF-2 (reinspection of JP2, JP7, JP16 known flaws). One additional branch noted on JP16 indication compared to previous exam in 2000. No discernable change in previous indications on JP2 and JP7. No other RI.
		VT-1, VT-3	Reinspected repair on Jet Pump 19/20 RS-1. NRI
	05/07	EVT-1	Re-measured previous indications at AD-3a,b on JP2, JP7 and JP 16. No changes.
		VT-1, VT-3	Inspected all main wedges with no unusual wear noted. Inspected one aux wedge and set screw. NRI.
	05/09	EVT-1	71 medium priority components inspected to complete baseline exams. NRI.
		VT-1	Inspected all main wedges with no unusual wear noted. Inspected one aux wedge and set screw. NRI. Replaced one hold down beam on JP05. Installed one aux wedge on JP05 due to gap discovered during post-installation inspection.
		VT-3	Inspected IN-5 bolting. Inspected one JPSL clamp installed in 2007. NRI.
	05/11	EVT-1	1 medium priority Riser Brace (RB-1a on JP 4. NRI. 15 high priority riser welds (RS-1, RS-2 and RS-3 on risers 1/2, 5/6, 7/8, 13/14, 19/20, except RS-1 on JP 19/20 which is covered by a clamp). One RI for JP 13/14 which had two indications reported in the HAZ of the RS-2 weld on the elbow side of the weld on the extrados of the elbow. An INR documents this condition; technical evaluation performed to accept as-is for one cycle of operation. Examined the remaining 5 RS-2 welds for

			extent of condition with no additional reportable indications identified. 10 medium priority riser welds (RS-8 and RS-9 welds on risers 3/4, 9/10, 15/16, 17/18). NRI. 12 medium priority DF-1 and DF-2 welds (JP 2, 3, 4, 5, 8, 9, 12, 13, 14, 17, 18, and 19). NRI. 14 high priority AD-3a,b welds (JP 2, 3, 4, 5, 7, 8, 9, 12, 13, 14, 16, 17, 18, 19) (reinspection of JP2, JP7, JP16 known flaws). An INR documents no change in known flaws on JP2 and JP7. Previously reported JP16 flaw was found to be a non-relevant scratch. 18 medium priority AD-1 and AD-2 welds (both welds on JPs 1, 2, 6, 7, 10, 13, 14, 19, and 20). NRI.
		UT	Performed UT on 8 Modified Group-2 Jet Pump Beams. The remaining 12 beams are Group-3 style beams and were not inspected. The UT identified no reportable indications.
		VT-1	20 Jet Pump wedges WD-1. An INR documents existing wear on JP18 with no discernable changes; accept as-is. Two INRs also document no change in slight wear on JP10 and JP19 wedge rod sleeves; accept as-is. Examined Aux wedges and set screws on JP5 and JP20. Examined the JP sensing line clamp on JP 2. Examined the retainer cup tack welds on 6 swing gates on JP 6, 12, 14, 16, 19, 20. An INR documents no change in a JP 19 tack weld area where fusion to the bracket brace metal is not evident. No rotation evident. Accept as-is.

	03/13	EVT-1	Re-measured two AD-3a/b welds with known indications on JP2 and JP7; no changes noted. Examined the following welds with NRI: • (2) RB-1b welds (JP Riser 9/10 and 19/20) • (3) RB-2b welds (JP 3/4, 9/10 and 19/20) • (2) RB-2a welds (JP 3/4 and 19/20) • (5) MX-1 welds (JP 1,5,9,17, & 20) Examined the exposed edge of two RB-2 welds on JP 5/6 and 7/8 that are covered by repair clamps with NRI. Examined the areas on JP 5/6 and 7/8 Riser pipes that were repaired with a clamp for signs and growth of the known cracks near the RS-8 and 9 welds. Some crack tips were noted, but no further growth was evident.
		EVT-1/ VT-1, VT-3	Re-examined known indication on JP 13/14 RS-2 weld prior to repair; no changes noted. Installed permanent repair clamp over RS-2 weld. Documented the as-left condition of the clamp.
		VT-1	Examined the following Jet Pump Restrainer hardware (swing gates): • Main Wedges on JP's 10, 18, and 19 • Aux wedges and set screws on JP5 (VS), 13 (VS/SS), and JP20 (SS) • Retainer Cup tack welds on JP,9,10,11 plus follow-up exam on JP19 INR's issued for recordable indications on JP 19 retainer cup tack welds and JP 10, 18, and 19 minor WD-1 wear; accept as-is.
		VT-1/ VT-3	Examined JP 19/20 RS-1 weld repair clamp with NRI.
		VT-3	Examined Slip Joint Clamps on JP 13 with NRI.

			Examined JP Beam Retainer clips on JP 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 17, 18, 19, and 20 with NRI Examined JP 11 Sensing Line clamp with NRI Examined replaced swing gates on JP 6 and 7, with NRI. Examined replaced swing gates on JP 20 with an INR for previous damage to the SS Set Screw Block.
	03/15	EVT-1	Re-inspected 45 High and Medium Priority welds; all except JP02 and 07 with NRI: • 2 -RB-1 JP11/12, JP15/16 • 1- RS-1 JP03/04 • 3 -RS-4 JP03/04, 09/10, 17/18 • 3- RS-5 JP03/04, 09/10, 17/18 • 4 -RS-8/9 JP05/06, 07/08 (reinspected pipe above and below the repair clamp as follow-up to past cracking and determine if the crack tips are growing) • 1- MX-1 JP10 • 10- MX-3a/b JP04, 05, 09, 10, 11 • 2- DF-1 JP11, 16 • 4-AD-3a/b • 2-RS-8/9 JP13/14 • 4-RB-1a/b JP Riser 5/6 & 7/8 • 4- DF-2 JP06,07,14, & 20 • 2- AD-3a/b JP06 & 20 • 1- AD-1 JP08 • 2- AD-2 JP08 & 12 Note- JP02 & JP07 AD-3 welds were reinspected as a follow-up to previous indications with no changes noted in Q1R23. Evaluations were performed that support 2-cycles of operation on JP02 and 1-cycle of operation on JP07.
		VT-1/ VT-3	Examined 3 Repair Clamps with NRI: • 1-RS-2 JP13/14

			• 1-RS-8/9 JP05/06 • 1-RS-8/9 JP07/08 Examined 2 replacement parts installed last outage with NRI: • 1-Swing Gate / retainer nuts and ratchet • 1-Jet Pump Beam bolt/ratchet
		VT-3	Re-examined 16 jet pump components with NRI: • 1 -JP Slip Joint Clamp JP14 (see SC-12-14) • 6 -JP Sensing Line Repair Clamps JP01, 03, 10, 12, 13, 20 (10 year inspection) • 5 -IN-5 JP06, 11, 14, 15, 17 • 4 -JP Beam Retainer Clips JP07, 13, 15, 16 (JP07 Slot)
		VT-1	Re-examined 17 jet pump components with NRI, except JP15 and 19 retainer cup welds: • 1 - WD-1 Main Wedge and Rod JP14 post Q1R22 replacement • 6 -JP Aux Wedges; JP05 VS, JP 13 VS/SS, JP 14 VS/SS, JP 20 SS • 4 -Retainer Cup tack welds JP07, 9, 15 and 19 (as follow-up). JP15 and JP19 have no intact retainer cup tack welds and will be inspected each outage per evaluation; accept as is. • 2-JP19 SG retainer nuts 4 -Slip Joints JP10, 14, 18, 19 (per SC 12-12
	04/17	EVT-1	Inspected 61 High and Medium Priority welds; all except JP02 and JP16 with NRI: • 5 RB-1, 5 RB-2, 5 RS-1, 5 RS-2, 5 RS-3, 3 RS-4, 3 RS-5, 2 RS-8, 2 RS-9, 5 IN-5, 3 DF-2, 1 AD-1, 1 AD-2, 8 AD-3a, 8 AD-3b. JP 02 has a known visual indication in the HAZ below the AD-3b weld; no changes noted. JP16 has a past longitudinal indication in the backing ring between the AD-3a/b welds which was re-evaluated as

			a scratch in 2011, but was reconfirmed as a RI flaw in 2017 with no changes noted. Both welds were evaluated as acceptable for 2-cycles. No scope expansion was required since these were previously identified indications.
		UT	Inspected 119 standpipe High and Medium Priority welds with UT for the first time: • 17 MX-3a, 17 DF-1, 17 DF-2, 15 DF-3, 14 AD-1, 11 AD-2, 14 AD-3a, 14 AD-3b. All NRI except: 1 previous visual flaw was confirmed and 3 new UT flaws were identified in JP02 AD-3b/DF-3 weld, 2 previous visual flaws were confirmed and 1 new UT flaw was identified in JP07 AD-3b/DF-3 weld, 1 new UT flaw was identified in JP03 AD-3b/DF-3 weld, 1 new UT flaw was identified in JP04 DF-2 weld, 1 new UT flaw was identified in JP13 DF-2 weld. The JP07 weld was evaluated as acceptable for 1-cycle. The other 4 welds were evaluated as acceptable for at least 2-cycles. Scope expansion for all AD-3/DF-3 and DF-2 welds was completed as required using a combination of UT and/or EVT-1 techniques; UT scanning could not be completed at all locations due to poor sensor coupling and tooling issues.
		VT-1	Inspected Swing Gate Restrainer hardware: • 3 Main Wedges as follow-up for previous wear with no significant changes. • 2 Aux Wedges as follow-up for previous wear with no significant changes. • 2 Retainer Cup tack welds as follow-up for previous indications with no significant changes.

			• 6 Set Screw for gaps on 3 jet pumps with new flaws with NRI.
CRD Guide Tube (BWRVIP-47)	11/02	VT-1, VT-3 on CRGT-1; EVT-1 on CRGT-2 & 3	Examined 9 sets of guide tube welds (CRGT-1, CRGT-2, and CRGT-3) and one additional weld (CRGT-2) per BWRVIP-47. No Indications.
	05/09	VT-3, EVT-1	Examined 9 sets of CRGT-1 and FS/GT–ARPIN (NRI) and 9 CRGT-2/CRGT-3. Metal slivers attached to one CRGT-2 from initial manufacture.
CRD Stub Tube (BWRVIP-47)	03/05	VT-3	Inspected various CRD Stub Tubes / welds in the Lower Plenum in the Lower Plenum area thru disassembled jet pumps 6, 7, and 20 (72°, 82°, and 312 ° azimuths) and thru various fuel cells near the center of the core with NRI.
	03/13	VT-3	Examined 3 CRD Stub Tubes and welds at azimuth 222° while performing Lower Plenum exams associated with JP 14 disassembly. NRI.
In-Core Housing (BWRVIP-47)	N/A	N/A	N/A
IRM/SRM Dry Tubes (SIL 409)	03/94	VT	Replaced 2 dry tubes 1994.
	03/96	VT	Replaced 5 dry tubes in 1996.
	10/00	MVT-1	Inspected original dry tubes at 7 locations. No recordable indications.
	11/02	VT-1	Examined 5 dry tubes. Verified plungers engaged at Top Guide. No Reportable Indications.
	04/05	N/A	All remaining original dry tubes (5) replaced.
	03/13	EVT-1	Examined IRM 14 and SRM 22 Dry Tubes with NRI.
	03/15	EVT-1	SRM 24 and IRM 11dry tubes inspected. IRM 11 NRI. SRM 24 RI; no cracking

			noted, but minimal plunger engagement in the Top Guide was identified. Evaluated SAT for 1-cycle.
	04/17	EVT-1	Inspected five (5) Dry Tubes for cracking per SIL 409: IRM 12, 14, 16, and 17 and SRM 22. NRI
		VT-1	Inspected ten (10) Dry Tubes for Upper Plunger Engagement; IRM 12, 13, 14, 15, 16, 17, and 18 and SRM 21, 22, 23. RI-partial loss of engagement on all Dry Tubes except IRM 15, with IRM 12 and 16 having minimal remaining engagement. Evaluated as acceptable for 2-cycles, except IRM 12 and 16 which need replacement in 2019. Note-SRM 24 Dry Tube was replaced due to minimal plunger engagement
Standby Liquid Control (BWRVIP 27)	04/05	PT	Nozzle To Safe End, N10-F1. NRI
	05/09	PT	Nozzle To Safe End, N10-F1. NRI
Instrument Penetrations (BWRVIP-49)	03/13	EVT-1 and VT-3	Examined interior of four instrument nozzles N11A, N11B, N12A and N12B with NRI.
Vessel ID Brackets (BWRVIP-48)	03/94	VT-1 and VT-3	Section XI inspections of jet pump riser brace, dryer, feedwater sparger, core spray, and surveillance capsule holder brackets, performed once per interval. VT-3 or VT-1 if in beltline region. No indications noted.
	04/05	VT-1, VT-3	Examined two Moisture Separator shroud guide rod support brackets. Minor gouges and bent top pins. No changes since previous inspection in 11/03 (F51).
		VT-3	Examined two steam dryer guide rod support brackets upper and lower (four inspections). NRI
		EVT-1, VT-3	Examined four steam dryer wall support lugs. NRI

		VT-1, VT-3	Examined six upper and six lower surveillance sample bracket attachments to RPV and sample holders. NRI except for one sample holder that was not engaged in the lower bracket. Bracket was re-engaged during the outage.
		EVT-1, VT-3	Examined eight feedwater sparger end-bracket assemblies. Five of eight had less than three protruding threads. Tightened and applied additional tack welds.
		VT-3	Examined eight feedwater sparger lug to vessel attachment welds. NRI.
	05/07	EVT-1, VT-3	Examined four steam dryer wall support lugs (WSL). Rub marks/gouges from dryer lifting noted on cladding at three of the four WSLs. Re-examined one bent Moisture Separator guide rod support bracket. No change since 2003.
	05/09	EVT-1, VT-3	Examined four steam dryer wall support lugs (WSL). Rub marks/gouges from dryer lifting noted on cladding at three of the four WSLs. Re-examined one bent Moisture Separator guide rod support bracket. No change since 2003.
	05/11	EVT-1, VT-3	Examined all four steam dryer wall support lugs (WSL) per BWRVIP-48-A. An INR documents rub marks/gouges from dryer lifting on all four WSLs; there was one new indication noted due to rubbing on the 220° lug and no change to the other three lugs; accept as-is. Re-examined one bent Moisture Separator guide rod at 200°. An INR documents no change; accept as-is.
	03/13	EVT-1, VT-3	Examined all four steam dryer wall support lugs (WSL). An INR documents rub marks/gouges from dryer lifting on all four WSLs; no changes noted; accept as-

			is. Re-examined one bent Moisture Separator guide rod at 200°. An INR documents no change; accept as-is. Examined two JP Riser Brace attachment welds RB-1a on JP 9/10 and 19/20 with NRI.
	03/15	VT-1, VT-3	Re-examined the four steam dryer wall support lugs (WSL) for code compliance and on-going wear using VT-1/VT-3. Rub marks/gouges from dryer lifting noted on cladding all four WSLs; no apparent changes from last outage and evaluated as acceptable as-is.
		VT-1	Re-examined all six Surveillance Sample Holder Lower Bracket attachment welds with NRI.
		EVT-1	Examined two Jet Pump RB-1 attachment welds with EVT-1
		VT-3	Re-examined four Upper GRSBA attachment brackets with NRI, except noted damage to 3 damaged guide rods that were evaluated as accepted as-is. Re-examined two lower GRSBA attachment brackets with NRI. Re-examined all six Surveillance Sample Holder Upper Bracket attachment welds with NRI.
	04/17	VT-3	Re-examined the 8 FW Sparger Bracket attachment welds for the 5th Interval with NRI
		VT-1	Re-examined the 4 Steam Dryer WSLs for ongoing bracket/pin wear. RI, but no discernible changes noted.
LPCI Coupling	N/A	N/A	Not applicable to this plant.
Steam Dryer (SIL 644, BWRVIP-139)	03/05	Best effort VT-1, VT-3	The steam dryer was originally scheduled to be replaced during Q1R18, but was not ready in time (the dryer was later replaced

			in May 2005). The following inspections were then performed during Q1R18: Examined exterior surfaces including outer hoods, historical repair areas, tie bars and attachment welds, four lifting assemblies, four hold down assemblies, two man way covers, cover plates, gussets, upper ring welds, vertical guide welds, outlet plenum lower horizontal welds, outlet plenum vertical welds, and perforated plates. Previous indications were identified that had been repaired, stop drilled or dispositioned to use as is in 2003. Additional indications were noted in the perforated plates. Examined interior surfaces including: drain channel welds, supports, vertical and horizontal plates, support ring, horizontal cross beams, and horizontal cross beam gussets. Previous indications were identified that had been repaired, stop drilled or dispositioned to use as is in 2003. New indications were observed in dryer bank vertical welds and vertical struts in the ID. Examined interior and exterior skirt. Indications noted. Dryer was repaired and returned to service prior to replacement in May 2005.
	05/06	Best effort VT-1, VT-3	Performed baseline inspection of new steam dryer installed in June 2005 per BWRVIP-139 and GE recommendations. NRI
	05/07	Best effort VT-1, VT-3	Performed inspection steam dryer per BWRVIP-139 and GE recommendations. NRI
	05/09	Best effort VT-1, VT-3	Repeated inspections on steam dryer per BWRVIP-139 and GE recommendations (same scope as 2006 and 2007). NRI
	05/11	General Visual/ EVT-1	Performed general visual inspections of the replacement steam dryer OD per GE recommendations, No reportable indications.

	03/13	General Visual/ EVT-1	Performed general visual inspections of the Steam Dryer OD per GE recommendations and previous indications. No changes noted and NRI.
	03/15	EVT-1	Re-examined two TEE braces with NRI.
	04/17	VT-3	Performed general visual inspections (as VT-3) of the Dryer OD Top Banks and sides. NRI.
		EVT-1	Performed examinations of the two Tee Braces, SD-BA-TEE BRACE-OD and SD-BF-TEE BRACE-OD. NRI.
		VT-1	Performed inspection of 72 welds (approximately 30% of the total weld population). No reportable indications noted. NRI.
Steam Separator	04/17	VT-3	Examined 12 Middle Support Ring Gussets (MSRG) and 12 Upper Support Ring Gussets (USRG). Re-inspected indication on MSRG 01 with no changes noted. MSRG 19 and MSRG 46 had new cracks; evaluated as acceptable for 1-cycle. Inspected 15 of the peripheral standpipes, tie braces, and welds (about 10%). NRI, except 3 bent tie braces noted.
Feedwater Spargers (NUREG 0619)	1982	Manual UT	UT of all four N4 nozzles and inner radii. NRI
	1986	Manual UT	UT of all four N4 nozzles and inner radii. NRI
	1989	Manual UT	UT of all four N4 nozzles and inner radii. NRI
	1992	Manual UT	UT of all four N4 nozzles and inner radii. NRI
	1996	Manual UT	UT of all four N4 nozzles and inner radii. NRI

	1998	UT (GERIS)	UT of all four N4 nozzles and inner radii. Acceptable.
	2002	UT (GERIS)	UT of all four N4 nozzles and inner radii. Acceptable.
		EVT-1/VT-3	Examined all 8 Sparger end brackets per NUREG-0619 program and BWRVIP-48. No indications.
	04/05	VT-1, VT-3	Visual inspection of sparger flow holes and welds. Slight distortion noted in one flow hole. A small piece of wire found in one flow hole. All FW sparger end bracket stop nuts were run up and tacked welded into place.
	05/07	VT-1, VT-3	Examined all 8 Sparger end brackets. Top of pins are wearing into top side of bracket on 3 end brackets.
		VT-1	Performed VT-1 of flow holes. NRI.
		UT	UT of all four N4 nozzles and inner radii. NRI.
	05/09	VT-1, VT-3	Examined all 8 Sparger end brackets. Top of pins are wearing into top side of bracket on 3 end brackets. New (slight) wear identified on two brackets. No change in previous wear on 3 other brackets.
	05/11	VT-1, VT-3	Examined all 8 Sparger end brackets per GE SIL 658. Top of pins show minor wear into top side of bracket on 5 end brackets. An INR documents no change; accept as-is. One new indication on a bottom tack weld of the pin to nut was identified at the 206° position; An INR documents this condition; accept as-is.
	03/13	VT-1, VT-3	Examined all 8 Sparger end brackets per GE SIL 658. Top of pins show minor wear into top side of bracket on 5 end brackets. An INR documents no change;

			accept as-is.
	03/15	VT-1, VT-3	Examined all 4 Spargers, sparger welds, sparger nozzle welds, end bracket welds, flow holes and vessel nozzle bend radii per NUREG 0619 with NRI.
	04/17	VT-1	Re-examined all 8 Sparger end brackets per GE SIL 658 and on-going wear. Pin heads show minor wear into top side of brackets on 7 of the 8 end bracket locations. An INR documents no change at the 6 previously known locations. One bracket with new wear was identified at 107° location. Evaluated as acceptable for 2-cycles of operation.
Cast Austenitic Stainless Steel (CASS)	03/13	EVT-1	Inspected one set of the following CASS materials for License Renewal: • (1) Fuel Support Piece • (1) CRGT base • (1) JP Mixer Flange • (1) JP Mixer Flare • (1) JP Mixer Ring • (1) JP Inlet mixer nozzle • (1) JP Inlet mixer elbow
	03/15	EVT-1	Examined 7 CASS components on JP10 and FSC 02-23 with NRI.
	04/17	N/A	Note-Per Site EC 618510 Quad Cities will no longer inspect CASS components.
Lower Plenum	03/05	EVT-1/ VT-3	Conducted Lower Plenum exams disassembled jet pumps 6, 7, and 20 (72°, 82°, and 312 ° azimuths) and thru various fuel cells near the center of the core with NRI. Examined the following: undersides of H8 and H9 near the open jet pumps, and H10 and H12 at azimuths 35°, 95°, 275°, and 335°, and various CRD Stub Tube welds/housing, and RPV bottom drain nozzle interior surface. All NRI, except H12 at 95° had a linear indication that was thought to be a crud line or weld edge shadow. This is scheduled to be re-examined in 2015.

	03/13	EVT-1/VT-3	Conducted Lower Plenum exams disassembled jet pump 14, azimuth 222 °. Examined the following: undersides of H8 and H9 near JP 14, H10 and H12 at azimuths 215°, and three CRD Stub Tube welds/housing near JP 14. All NRI,
Dissimilar Metal Welds (BWRVIP-75-A Cat. A)	05/09	N/A	Four Category A DM welds examined per ASME Section XI, Appendix VIII, Supplement 10. All of the exams were automated. No flaws were identified and no weld overlays were performed.
	05/11	N/A	No Category A DM welds examined
	03/13	N/A	No Category A DM welds examined
	03/15	N/A	No Category A DM welds examined
	04/17	N/A	No Category A DM welds examined
Dissimilar Metal Welds (BWRVIP-75-A Cat. B)	05/09	N/A	No Category B DM welds examined
	05/11	N/A	No Category B DM welds examined
	03/13	N/A	No Category B DM welds examined
	03/15	N/A	No Category B DM welds examined
	04/17	N/A	No Category C DM welds examined
Dissimilar Metal Welds (BWRVIP-75-A Cat. C)	05/09	UT	Examined 5 Category C DM welds per BWRVIP-75 and ASME Section XI, Appendix VIII, Supplement 10 (out of a total of 15 Category C welds that were examined). No flaws were identified and no weld overlays were performed. All of the exams were automated. None of the welds contained Alloy 82/182 butter.
	05/11	UT	Examined one (1) Category C DM weld per BWRVIP-75 and ASME Section XI, Appendix VIII, Supplement 10 (out of a total of 13 Category C welds that were examined). No flaws were identified and no weld overlays were performed. The

			exam was manual. None of the welds contained Alloy 82/182 butter.
	03/13	N/A	No Category C DM welds examined
	03/15	N/A	No Category C DM welds examined
	04/17	N/A	No Category C DM welds examined

Reactor Internals Inspection History

Plant: **River Bend**

Components in BWRVIP Scope	Date or Frequency of Inspection	Inspection Method Used	Summarize the Following Information: Inspection Results, Repairs, Replacements, Reinspections
Core Shroud	94	VT-1/ VT-3	Partial inspection during forced outage. Welds H-3 thru H-7, Limited vertical weld inspection. No indication detected.
	96	VT-3	ASME XI inspection of accessible areas including the grid. No indications detected.
RF-7	97	UT	UT from OD, Welds H3, H4, H6A, H7 (No indications)
RF-12	Oct 2004	UT	UT From OD: Welds H6A and H7 (no indications)
RF-14	Jan. 2008	UT	H3 no indications 76.6% inspected H4 indications 92.7% inspected 9% weld flawed
RF-16	Feb 2011	UT	UT- H6A and H7 Welds- No indications
RF-19	Feb 2017	UT	UT from OD: H1, H2, H3, H4, H5, H6A, H6B, H7, V11, V12, V13 and V14 Weld Coverage Flaws Notes H1 51.7% 0% H2 51.7% 0% H3 54.5% 0% Lower side only H4 57.4% 55.4% H5 19.3% 0% H6a 17.2% 0% H6b 27.6% 9.7% Lower side only H7 27.1% 0% V11 84.8% 0% V12 86.2% 2.8% V13 93.7% 0.9% V14 93.7% 0%

Shroud Support	94	VT-1/ VT-3	Inspection of accessible areas during forced outage. Access hole cover; VT. No indications.
	96	VT-3	Access hole cover. No indications.
RF-8	1999	VT-1	Access hole cover. No indications
RF-9	2000	EVT-1	Shroud Support to Shroud (No Indications)
RF-9	2000	EVT-1	Support Plate to Shroud (No Indications)
RF-10	Oct. 2001	VT-1	Access Hole Cover- No indications
RF-12	Oct. 2004	VT-1	Access Hole Cover (No indications)
		UT	UT From Bio-shield wall H8 & H9 (no indications)
RF-14	Jan 2008	EVT-1	Access hole cover NRI
RF-16	Feb 2011	EVT-1	Access hole cover NRI
RF-18	March 2015	UT	UT From Bio-shield wall H8 & H9 H8 – flaw @ 173.2 degree azimuth H9 (no indications)
		EVT-1	EVT-1 on H8 from 162 – 198 degrees azimuth NRI
RF-19	Feb 2017	EVT-1	Access hole cover NRI
Core Spray Piping	1987 to present	VT-1/ VT-3	Piping and welds in annulus, every other cycle, starting 1994 every cycle. No indications.
RF-7	1997	EVT-1/ MVT-1	BWRVIP-018 (Baseline Inspection) No indications
RF-8	Apr 1999	EVT-1/ MVT-1	BWR VIP-018 No Indications
RF-9	March 2000	EVT-1/ MVT-1	BWR VIP-018 No Indications

RF-10	Oct. 2001	UT	12 welds examined No Indications
RF-11	March 2003	EVT-1	17 welds examined No Indications
RF-12	Oct 2004	UT	8 welds examined No indications
RF-13	April 2006	EVT-1	8 welds examined No indications
RF-14	Jan. 2008	EVT-1	8 welds examined No indications
RF-15	Oct 2009	EVT-1	20 welds examined No indications
RF-16	Feb 2011	EVT-1	8 welds examined No indications
RF-17	Feb 2013	EVT-1	18 welds examined No indications
RF-18	March 2015	EVT-1	12 welds examined No indications
RF-19	Feb	EVT-1	22 welds examined No indications
Core Spray Sparger	1987 to present	VT-1/ VT-3	Nozzles, end caps, support (guides), every other outage. Selected Tee (welds) every other outage. All tee (welds), end caps and nozzles each outage starting 1996.
RF-7	1997	EVT-1/ MVT-1	BWRVIP-018 (Baseline Inspection) No indications
RF-8	Apr 1999	EVT-1/ MVT-1	BWRVIP-018 No Indications
RF-9	March 2000	EVT-1/ MVT-1	BWRVIP-018 No Indications
RF-10	Oct.2001	EVT-1, VT-1	BWRVIP-018-No indications
RF-11	March 2003	EVT-1/ VT-1	36 welds examined No indications
RF-12	Oct 2004	EVT-1/ VT-1	32 items examined no indications
RF-13	April 2006	EVT-1/ VT-1	15 items examined no indications

RF-14	Jan 2008	EVT-1/ VT-1	42 items examined no indications Includes spare brackets pin and pad, pad
RF-15	Oct 2009	EVT-1/ VT-1	28 items examined one of two tacks welds cracked on alignment pin at the @ the276 degree azimuth annulus side
RF-16	Jan 2011	EVT-1/ VT-1	34 items examined –No indications
RF-17	Feb 2013	EVT-1/ VT-1	40 items examined – no indications
RF-18	March 2015	EVT-1/ VT-1	36 items examined – no indications
RF-19	Feb 2017	EVT-1/ VT-1	52 items examined – no indications
Top Guide (Rim, etc.)	1987 to present	VT-3	100% per Interval (Hold down studs, nuts and keeper). No indications.
RF-14	Jan. 2008	VT-3	No indications
RF-18	March 2015	EVT-1	4 cells and 2 rim areas examined – No indications
RF-19	Feb 2017	VT-3	Hold-down studs, nuts and keepers. NRI
Core Plate (Rim, etc.) RF-14	N/Access Jan 2008	N/A VT-3	N/A 8 exams (Jet Pump disassembled)
SLC			
RF-12	Oct 2004	Enhanced VT-2	VT-2 inspection of N11 nozzle at vessel hydro No leakage observed
RF-13 SLC	April 2006	Enhanced VT-2	VT-2 inspection of N11 nozzle at vessel hydro No leakage observed
RF-14	Jan 2008	Enhanced VT-2	VT-2 inspection of N11 nozzle at vessel hydro No leakage observed
RF-15	Oct 2009	Enhanced VT-2	VT-2 inspection of N11 nozzle at vessel hydro No leakage observed

RF-16	Feb 2011	Enhanced VT-2	VT-2 inspection of N11 nozzle at vessel hydro No leakage observed
RF-17	Mar 2013	Enhanced VT-2	Inspection of N11 nozzle during vessel pressure test. No leakage observed
RF-18	March 2015	Enhanced VT-2	Inspection of N11 nozzle during vessel pressure test. No leakage observed
RF-19	Feb 2017	Enhanced VT-2	Inspection of N11 nozzle during vessel pressure test. No leakage observed
Jet Pump Assembly	1987 to present	VT-1/VT-3	Twenty pumps. 1/3 inspected each period first Interval(Diffuser Assembly, Riser Assembly, Riser Braces, inlet suction area, riser brace, wedge assembly, Hold down beam (bolt keeper and tack welds). Wedges, adjusting screws (tack welds), sensing lines receive VT per various SILs. Jet Pump Beams replaced 1994. VT of complete assemblies in 1994 forced outage.
RF-7	1997	EVT-1 MVT-1 MVT-1	Jet Pump Riser Elbow Welds No indications Jet Pump Riser Brace Welds (6 of 10) No indications
RF-8	1999	EVT-1	Restrainer Assembly (6 of 10) No movement
RF-10	Oct. 2001	EVT-1	Riser Pipe to Transition Piece (Limited Access) No Indications (5 ea) Inlet elbow to sleeve weld, inlet sleeve to nozzle weld, restrainer bracket wedge, riser pipe of the upper brace and lower brace attachment yoke welds (6 welds inspected
RF-11	March 2003	EVT-1	RB welds 14 welds examined JP-11 thru 20, No Indications RS-3 weld 5 welds examined JP-11 thru 20 No Indications RS-6 weld 10 welds examined JP-11 thru 20 No Indications

			RS-7 weld 10 welds examined JP-11 thru 20 No inactions RS-8 weld 5 welds examined JP-11 thru 20 No Indications RS-9 weld 10 welds examined JP-1 thru 20 One indication found JP-19/20 riser brace IN-1/IN-2 weld 10 welds each examined JP-11 thru 20 No indications found DF-1, DF-2, DF-3A, DF-3B weld 10 welds each examined JP-11 thru JP-20. No indications found. AD-2 weld 10 welds examined JP-11 thru JP-20 No indications found WD-1 weld 6 welds examined JP-11,12,13,14,19 and 20 No indications found
RF-12	Oct. 2004	EVT-1/ VT-1	RS-9 previous crack found in RF-11(Qty 1) & RS-8 (Qty 1) & WD-1 (Qty 1)
RF-13	April 2006	EVT-1	RS-9 reinspection previous crack & RS-8
RF-14	Jan. 2008	EVT-1/ VT-1	JP-19/20 –RS-8 & 9 AD-1, AD-2, DF-3a, b , IN-1 & 2, WD-1, DF-1, 2 (Jet Pump disassembly) JP-1 thru 20 RB-1a,b,c,d, No indications except for previously reported RS-9 indication
RF-15	Oct 2009	EVT-1/ VT-1 VT-3/UT	VT-3 -JP-1 thru 20 sensing lines at welded attachment & penetration. JP 1 thru 10- 140 welds and 10 expanded scope of the AD-2 welds. AD-2 indication at JP 4, UT was performed at the AD-2 from inside and indication was found non-relevant VT-1 of WD-1 wedges at JP 19/20
RF-16	Jan 2011	EVT-1/ VT-1	Examined RS-8 and RS-9 welds as required by OE from Laguna Verde Qty-30 welds no indications, also examined WD-1 (wedges) on all 20 Jet Pumps No wedge wear reported.

RF-17	Feb 2013	UT	UT of group 2 Jet Pump Beams, JP 1 thru 18 – no indications
RF-18	March 2015	EVT-1/ VT-1	EVT-1 on welds DF-1, DF-2, DF-3a, DF-3b, IN-1 and IN-2 in JP 11 thru 15. EVT-1 on weld RS-3 on JP 11 thru 20. EVT-1 on weld RS-6 on JP 11, 13 and 15. EVT-1 on weld RS-7 on JP 12, 14 and 16. VT-1 & EVT-1 on weld RB-1a on JP 2 and 4. VT-1 & EVT-1 on weld RB-1b on JP 1 and 3. VT-1 & EVT-1 on welds RB-1d, RB-2b and RB-2d on JP 1. VT-1 & EVT-1 on weld RB-1c on JP 2. EVT-1 on weld RB-2a on JP 2 and 4. EVT-1 on weld RB-2c on JP 2. EVT-1 on weld RB-2b on JP 3. No indications
RF-19	Feb 2017	EVT-1/ VT-1	EVT-1 weld RS-1 JP 11-12, 13-14, 15-16 EVT-1 weld RS-2 JP 11-12, 13-14, 15-16 EVT-1 on weld RS-8 on JP 1-2, 3-4, 5-6 EVT-1 on weld RS-9 on JP 1-2, 3-4, 5-6 EVT-1 on weld AD-2 on JP 1, 2, 3, 4, 5 VT-1 on weld WD-1 on JP 1, 5, 9, 13, 17 No indications
Jet Pump Diffuser	see Jet Pump Assembly	N/A	N/A
CRD Guide Housing			
RF-11	March 2003	EVT-1/ VT-3	Inspected 15 control rod drive tubes. No indications observed.
RF-14	Jan 2008	VT-3	Viewed to the extent possible the CRDHs within view through JP19 & 20 to examine the cap to tube assembly weld (CRDH-1), tube to tube assembly weld (CRDH-4), and tube to reactor pressure vessel weld (CRDH/RPV-1). No indications observed.
RF-19	Feb 2017	VT-3	Cell 24-25 below core plate exam included CRD housings. NRI

In-Core Housing			
RF-4	92	VT-1	No indications.
RF-14	Feb 2008	VT-3	Best effort attempt to examine the ICH within view through JP19 & 20 on the in-core housing to reactor pressure vessel weld (ICH/RPV-1). No indications observed.
RF-19	Feb 2017		Cell 24-25 below core plate exam included In-Core Housings. NRI
In Core Dry Tube			
RF-4	1992	VT-3	8 IRM/SRM dry tubes inspected. No indications.
RF-6	1996	VT-3	12 IRM/SRM dry tubes inspected. No indications.
RF-8	1999	VT-1	
RF-11	March 2003	VT-1	5 IRM/SRM dry tubes inspected. No indications.
RF-14	Jan 2008	VT-1	IRM/SRM dry tubes QTY 10 inspected No indications
RF-15	Oct 2009	VT-1	Inspected 11 of 12 planned dry tubes. 5 dry tubes had indications and one dry tube inspection deferred until RF-15.
RF-16	Jan 2011	VT-1	Examined QTY-1 IRM and QTY-9 LPRM's no indications. Replaced 5 dry tubes with indications found in RF-14
RF-17	Mar 2013	VT-1	Examined QTY-10 LPRM's no indications. 10 dry tubes were replaced Inspected 18 dry tubes. Two dry tubes had crack indications and three dry tubes had wear. 4 dry tubes were replaced.
RF-18	March 2015	VT-1	Inspected 4 dry tubes. No indications. Replaced 10 dry tubes.

RF-19	Feb 2017	VT-1	Inspected 3 dry tubes. No new indications. Replaced 10 dry tubes.
Instrument Penetrations	1994	VT-3	Inspected penetration at vessel during forced outage. No indications noted.
Vessel ID Brackets	1987 to present	VT-1/VT-3	Section XI inspections once per interval. VT-3, or VT-1 if in beltline region. No indications noted.
Vessel Interior	Oct 2004	VT-3	Vessel cladding area as required by section XI No indications
Vessel Brackets	Jan 2008	VT-3, EVT-1	Feedwater brackets, Core Spray brackets, Steam Dryer brackets NRI
RF-14 Vessel Interior	Jan 2008	VT-3	Vessel Cladding
RF-16	Jan 2011	VT-3	Vessel Cladding
RF-19	Feb 2017	VT-3, EVT-1	Feedwater brackets, Core Spray brackets, Steam Dryer brackets, Guide Rod brackets and Surveillance Specimens. NRI
LPCI Coupling	1989, 92	VT-3	Two of three lines in 1989 and two of three lines in 1992. No indications.
RF-8	1999	MVT-1	No Indications (1 ea.)
RF-9	2000	EVT-1	No Indications (2 ea.)
RF-12	2004	EVT-1	9 welds inspected. No indications
RF-15	Oct 2009	EVT-1	7 welds examined. No indications
RF-17	Feb 2013	EVT-1	8 welds examined. No indications
RF-18	March 2015	EVT-1	1 weld examined. No indications
RF-19	Feb 2017	EVT-1	9 welds inspected. No indications
Steam Dryer			
RF-9	2000	EVT-1	Indications identified CR-RBS-0686
RF-10	2001	EVT-1	Indications less than 4.5 inches

RF-11	2003	EVT-1	Indications less than 4.5 inches
RF-12	2004	VT-3	Indications less than 4.5 inches
RF-13	2006	EVT-1	New Indication identified dryer shirt ¾"long Ref. CR-RBS-2006-01770, indications identified in RF-9 less than 4.5"
RF-14	Jan 2008	VT-1	BWRVIP-139 exam 2 cracks found and repaired welds V14 and V27
RF-15	Oct. 2009	VT-1	Upper support ring indications greater than 4.5 JCO re-inspect next outage Re-examined indications and repaired welds on upper support ring, V-14 and V27 from RF-14 no changes noted
RF-16	Jan 2011	VT-1	Support Ring indications- No change
RF-17	Feb 2013	VT-1	Support Ring indications- No change
RF-19	Feb 2017	VT-1	BWRVIP-139 re-examination. New ¾"long indication identified in dryer end plate near 214° Ref. CR-RBS-2014-00903.
Feedwater Sparger Repair areas at AZ 45 & 135 degrees			
RF-7	1997	VT-1	No Indications
RF-8	1999	VT-1	No Indications
RF-9	2000	VT-1	No Indications
RF-10	2001	VT-1	No Indications
RF-11	2003	VT-1	No Indications
RF-12	2004	EVT-1	No indications
RF-13	2006	EVT-1	No indications

RF-14	Jan. 2008	EVT-1/ VT-3	Qty-8 Brackets to vessel and end brackets -NRI End brackets had ware on pins re-inspect next outage
RF-15	Oct 2009	VT-1	Re-inspected feedwater end brackets and the repair areas no changes noted
RF-16	Jan 2011	VT-1	Re-inspected feedwater end brackets and the repair areas no changes noted also examined Flow holes no indications
RF-17	Feb 2013	VT-1	Re-inspected feedwater end brackets and the repair areas no changes noted
RF-18	March 2015	VT-1	Re-inspected feedwater end bracket at 183 azimuth no changes noted
RF-19	Feb 2017	VT-1	Re-inspected feedwater end brackets and the repair areas. Changes were noted on 5 End Pins and bracket interfaces Ref. CR-RBS-2017-01397.
SHASM Retaining Pin			
RF-11	2003	VT-3	No wear noted.
RF-12	2004	VT-3	No wear noted. Qty 12 inspected.
RF-13	2006	VT-3	No wear noted. Qty 12 inspected.
RF-14	Jan 2008	VT-3	No wear noted. Qty 12 examined.
RF-15	Oct 2009	VT-3	No wear noted. Qty 12 examined.
RF-16	Jan 2011	VT-3	No wear noted. Qty 12 examined.
RF-17	Feb 2013	VT-3	No wear noted. Qty 12 examined.
RF-18	March 2015	VT-3	Qty 4 examined. Pin wear noted in Bolts 5 and 23.
RF-19	Feb 2017	VT-3	Qty 4 examined. Pin wear noted in Bolts 7 and 12.

Steam Separator Gussets RF-18	March 2015	VT-1	8 gussets examined. No indications.
Below Core Plate RF-14 RF-19	Jan. 2008 Feb 2017	VT-3 VT-3	QTY 16 items examined NRI Cell 24-25 including bottom of core plate, CRD housing, bottom head, bottom head drain, ICM housing and stabilizers. NRI
DM Welds BWRVIP-75-A RF-12 RF-14 RF-16 RF-19	Feb. 2004 Feb 2008 Feb 2011 Feb 2017	UT (PDI) UT (PDI) UT (PDI) UT (PDI)	Qty-10 (N2) Qty-17 (N1 Qty-2, N4 Qty-3, N5 Qty-4, N6- Qty-6, N9- Qty-2 Qty-2 (N4-Qty-2) Qty-2 (N5-Qty-2)

Reactor Internals Inspection History

Plant: **Susquehanna 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	1993, 1995, 1996, 1997, and 2001 results.		Unit #2 7RIO, circumferential welds H1 through H7 inspected ultrasonically using the GE OD Tracker system. Cracking found in H1 (21^0), H2 (94^0), H4 (68^0), H5 (5^0), and H6B (121^0). Structural margins were maintained based on BWRVIP documents GENE-523-113-0894, Rev. 1, and Supplement 1, Rev. 1, and independent calculations. Unit #2 8RIO (Spring 97), no shroud inspections scheduled based on inspection results of Unit #1 Shroud in fall of 1996. Unit 2 9RIO (Spring 1999), Welds H1, H2, H4 and H6B were examined this outage. Each of these welds exhibited cracking in the past. H4 was the worst weld showing 47.6% flawed in the circumferential direction. Analysis showed that 10 years of operation before reinspection was possible while maintaining adequate safety factors. No Recordable Indications for the 5 vertical welds inspected.
	2003	VT-3	Vertical Welds H6B/H7 at 90°and 270° to determine possible sources of interference to develop tooling necessary for future EVT-1
	2005	EVT-1	Three Vertical Shroud Welds, No Recordable Indications
		UT	GE OD Tracker for H3, H5, H6A, and H7. H3 No Recordable Indications, H5, H6A, H7 increase in % flawed from 1995 baseline exams. All welds acceptable per BWRVIP-76 flaw analysis.

	2007	EVT-1	Two Vertical Shroud Welds, No Recordable Indications
	2009	EVT-1	Eight vertical shroud welds. No Recordable Indications.
		UT	GE OD Tracker for H1, H2, H3, H4, H6A, H6B. Increase in percent flawed from previous exams for all welds expect H6A. All welds acceptable per BWRVIP-76 flaw analysis.
	2013	UT	Inspected 100% of weld length for the H9 weld from the OD. No recordable indications.
		EVT-1	Inspected Shroud Vertical Welds between H6B and H7 at both 090 and 270 degrees from the OD only. No recordable indications.
		VT-3	Inspected Shroud Flange from 240-360 DEG which encompassed the flange mating surface and seismic pins. Also, the overall condition of the Shroud Exterior at 000 and 180 DEG was inspected. No Recordable Indications
	2015	UT	Full Shroud UT inspection on Horizontal and Vertical welds. Slight growth of cracking. All welds acceptable per flaw analysis.
	2017	VT-3	Shroud Flange 000-060, No recordable indications.
Shroud Support	Prior to 1995	VT-1, VT-1 enhanced, and UT	VT-1 of 0^0 to 360^0 of H8 and H9 during the first interval with no recordable indications. Inspect (VT-1) every outage. No Recordable Indications to date. VT-3 of all 14 shroud support legs and support leg stub pad to RPV attachment

			welds per BWRVIP-38. No Recordable Indications. VT-1 examinations were performed on shroud weld H8 at 180 deg. to verify a previously noted crack adjacent to the access hole cover. The indication was determined to be non-relevant due to dark grit built up at the weld toe.
Baffle Plate	2011	VT-3	As found VT-3 examination of underside area surface of baffle plate (215-225). No Recordable Indications.
H8/H9	1995	EVT-1	Unit #2 7RIO (Fall 95) examined H8 and H9 (enhanced VT-1) for 360^0. No Recordable Indications.
	1997	UT	Unit #2 8RIO (Spring 97) UT of H9 from vessel OD and VT-1 enhanced of H8. No Recordable Indications.
	2003	EVT-1/ VT-3	EVT-1 of H8 to satisfy BWRVIP-38 and VT-3 of H8 and H9 underside VT-3 inspections performed with GE remote firefly inspection vehicle down diffuser inlet mixers removed for modification. No Recordable Indications.
	2009	EVT-1/ VT-3	EVT-1 of H8 to satisfy BWRVIP-38 and VT-3 per ASME XI. No Recordable Indications.
	2011	EVT-1/ VT-3	H9 inspected 25% per VIP-38 and ASME Section XI. No Recordable Indications. VT-3 examination of H8 and H9 welds-215-225 underside during jet pump 12 disassembly. No Recordable Indications.
Shroud Support Legs	2003	VT-3	Shroud Support legs inspected during Jet Pump Beam modifications. No Recordable Indications.
	2011	VT-3	Shroud support legs J-K examined during Jet Pump 12 disassembly. No Recordable Indications.

Access Hole Covers	2003 / 2007	VT-1	VT-1 of AHC welds at 0 and 180 degrees. No Recordable Indications.
	2009	EVT-1 /VT-3	EVT-1 of 0 and 180 degree AHC to satisfy BWRVIP-180 and VT-3 per ASME XI. No Recordable Indications.
	2017	EVT-1/ VT-3	EVT-1 of 0 and 180 degree AHC to satisfy BWRVIP-180 and VT-3 per ASME XI. No Recordable Indications
Shroud Head Bolts	2005	UT	UT exam of 43 "Old Style" Shroud Head Bolts per SIL 433. No Recordable Indications.
	2007	VT-3	VT-3 of Shroud Head bolts windows and pins for wear. Window / Pin wear discovered in 30 of 48 bolts. All acceptable one cycle. Two to be replaced next outage.
	2009	UT	UT exam of 41 "Old Style" Creviced" Shroud Head Bolts per SIL 433. No Recordable Indications.
		VT-3	VT-3 of two bolts that exhibited above normal wear in 2007. No change in condition noted. Bolts acceptable.
	2011	VT-3	VT-3 of Shroud Head Bolt 14, 16. Recordable Indications. No visual change from previously recorded indications. VT-3 of Bolt 48 with No Recordable Indications.
	2013	VT-2	The Shroud Head Bolts 14 and 16 were inspected. Both bolts had recordable indications (window/pin wear) that were present since 2007 with no discernible change in condition in 2013 when compared to 2011 inspections.
	2015	UT	UT of all old style Shroud Head Bolts. No failures.

		VT-3	All Shroud Head Bolts inspected. Wear noted on 40 out of 48. None replaced.
	2017	VT-3	10 Shroud Head Bolts visually inspected due to previous indications. 4 that were scheduled to be replaced 2017 were deferred. Some minor changes to wear.
Core Spray Piping	1980's to 1995	VT-1, VT-3	Piping and welds in annulus. No Recordable Indications.
	1997	VT-1 enhanced	Unit #2 8RIO (Spring 97) Inspect per BWRVIP-18, no recordable indications.
	1999	EVT-1	Inspect per VIP-18, no recordable indications.
	2001	EVT-1 & UT	Unit #2 10 RIO Inspect per VIP-18 Two indications were recorded, one on the P5 weld and one on the P8b weld. Both indications were evaluated to have expected lifetimes of 7.9 and 18.4 years respectively.
	2003	EVT-1	Examined core spray piping welds per BWRVIP-18 that were not inspected previous outage by UT, P4D, 7deg, P8A both loops 7, 170, 187, and 352 degrees. No Recordable Indications. Also EVT-1 of welds with indicated defects by previous UT, welds P5 352 degrees and P8B 187 degrees. No visible defects detected. Since defects are not visible through visual exam they are confirmed as subsurface.
	2005	EVT-1	BWRVIP-18A - EVT-1 of welds that do not have approved UT procedure and containing flaws. Scope similar to 2003 exams. No Recordable Indications. Note: It was determined that the P8B welds contain a site-specific double weld configuration; UT exam is not acceptable for collar to shroud weld. EVT-1 performed for BWRVIP-18A compliance.

		UT	UT exam by CSI 2000 of Core Spray piping welds per BWRVIP-18A. Welds examined both loops, P2, P3, P3, P6, and P7. Rotating sample of one each P4A, P4B, P4C, P4D welds. No Recordable Indications. P5 352 degrees P8B 187 degrees no growth in previously identified flaws.
	2007	EVT-1	BWRVIP-18A of welds that does not have an approved UT technique, P8A, P8B welds and 1 P4C weld and one P5 weld with UT discovered flaw. No Recordable Indications.
		VT-1	All 8 piping brackets and welds, PB.
	2009	EVT-1	Core Spray piping per BWRVIP-18A. All P2, P3, P5, P6, P7, P8A, and P8B welds. Two each P4A-D. One 2.5" crack in Cover Plate base metal adjacent to base metal gouge, Use As Is. No Recordable Indications in welds.
	2011	EVT-1	Examined N5A P1, P2, P3, P5, P6, P7, P8A, P8B and N5B, P1, P2, P3, P4, P5, P6, P7, P8A, P8B. No Recordable Indications.
		VT-1	N5B bracket weld A has a Recordable Indication, gouge, identified in a previous outage, no growth noted. N5B Bracket weld B has a new Recordable Indication for bracket and pipe wear.
	2013	UT	Inspected core spray piping per BWRVIP-18A at N5A and N5B nozzle locations: • Thermal Sleeve to T-Box P1 (060 and 300 DEG) • T-Box Cover Plate P2 (060 and 300 Deg) • Junction Box P3 (Left and Right) • Elbow P4a-c (007, 173, 187, 353 DEG) • Couples P5, P6, P7, P8a-b (007, 173, 187, 353 DEG).

			Two indications previously found were recorded via UT: • N5B P5 COUPL 353 Deg. indication measures 2.10" and shows possible growth of 0.18" from 2005 UT inspection. • N5B P8b COUPL 187 Deg. indication measured 0.49" and showed no growth since 2005 UT exam.
		EVT-1	For visuals, inspected all locations that could not be inspected two-sided UT OR were not accessible OR had previous indications: • Thermal Sleeve to T-Box P1 (060 and 300 DEG) • T-Box Cover Plate P2 (060 and 300 Deg) • Junction Box P3 (Left and Right) • N5A Elbow P4a weld • N5B P5 COUPL 353 DEG weld • N5A & N5B P4d welds (007, 173, 187, 353 DEG) • N5A & N5B P8a-b welds (007, 173, 187, 353 DEG). Recordable Indications found on the: • N5A 173 DEG Elbow P4a (no change from 2009 inspection) • N5B Junction Box Cover P2 (no change from 2011 inspection) Recordable Indications that had no change or growth in 2013 were also found on N5A Bracket Weld A and N5B Bracket Weld B. All other indications are non-recordable.
	2015	VT-1	N5A header bracket 01, N5A header bracket 03, N5A header bracket 04 has new wear seen on pipe from bracket rubbing.
	2017	EVT-1	P4D Elbows, No recordable indication.
Core Spray Sparger	1997	VT-1, VT-3	Unit #2 8RIO (Spring 97) Inspect per BWRVIP-18. Several Shroud Core Spray

			Support Bracket welds found with cracking on shroud ID. Determined acceptable to Use-as-is.
	2001	EVT-1	Inspect per VIP-18, No Recordable Indications.
	2003	EVT-1 / VT-1	Examined all four upper and lower spargers, EVT-1 S1 S2 S4 VT-1 S3a, S3b, S3c(lower), and sparger brackets welds (VT-3), per BWRVIP-18. No Recordable Indications. SB-03 reinspection of previous indication. Approximately 3" crack visible next to SB03 in shroud. Crack in shroud adjacent to SB03 evaluated as crack in vertical shroud weld per BWRVIP-76. Structural margins maintained.
	2005	EVT-1 / UT	EVT-1 exams of all 12 Core Spray Spargers Brackets (SBs). SB03 previous indication in shroud side. New indications found in shroud outside of HAZ during inspection of SB-02, SB-04, SB-11. UT performed utilizing GE Tracker tool for sizing of defects in shroud. BWRVIP-76 vertical weld defect acceptance criteria employed. All indications acceptable for multiple cycles.
	2007	EVT-1 / VT-1	Examined all four upper and lower spargers, EVT-1 S1 S2 S4 VT-1 S3a, S3b, S3c (lower), and sparger brackets welds (VT-3), per BWRVIP-18A. No Recordable Indications.
	2009	EVT-1 / VT-1	EVT-1 of four brackets with pervious indications on shroud side bracket welds HAZ. Additional cracking discovered in two brackets. VT-1 of eight brackets with no pervious indications. Shroud side HAZ cracking observed in three brackets.
	2011	EVT-1 / VT-1	Examined a total of 61 core spray sparger components including the following: N5A-B (S1, S2 S3A, S3B, S3C, S4),

			N5A-D (S1, S2 S3A, S3B, S4), N5B-A (S1, S2, S4), N5B-C (S1, S2, S4, S5). No Recordable Indications. N5A-B S3B NOZZ – 080 – 090 exam shows new Recordable Indication, a cracked lower elbow-to-nozzle tack weld.
	2013	EVT-1 / VT-1	Indications found on the N5 Sparger Support Welds. New indications or New Growth on previous indications of various lengths were discovered on the N5 CS Sparger Bracket Welds: • 01, 03, 07, 04, 08 The Middle Bracket was bent on Weld 09 Recordable indications with no change or growth from previous outages include: • Welds: 02, 10, 09 ,12 • The N5A-B S3B Nozzle The remaining welds: 05, 06, 11 have no recordable indications.
	2015	VT-1	Inspected the S1/S2 and S3 a, b, c. No relevant indications except on S3b and no changes to relevant indications.
		UT	Core Spray Sparger brackets at 45, 85, 96, 225, 264, 274, and 314 degrees were UT'd. Indications found on 45, 85, 96, 314. Indications acceptable and use as is.
	2017	VT-1	N5A Header Brackets 01, 03, 04 N5B Header Brackets 01 No change to wear, only movement.
		VT-3	N5A Bracket Weld A, No recordable indications.
Top Guide (Rim, etc.)	To 1995	VT-3	(VT-3) of accessible cells up to percentage of total over the interval (lower surfaces only). Also, inspection of hold-down bolts. Minor misalignment (bowing) of several cross-members of top guide.

		VT-3	Unit #2 7RIO (Fall 95). Eight cells lower surfaces and inspected wedges. No Recordable Indications.
	1997	VT-3	Unit #2 8RIO (Spring 97). Ten cells lower surfaces, no recordable indications.
	2003	VT-1	VT-1 of 22 Top Guide locations per BWRVIP-26. No Recordable Indications.
	2007	VT-3	Four VT-3 Code ASME XI exams made accessible during BWRVIP-47 Guide Tube exams. No Recordable Indications.
	2009	EVT-1	Three EVT-1 exams to satisfy BWRVIP-183. Two small, one-quarter inch each, cracks in one beam of one cell. Evaluated as acceptable.
	2011	EVT-1 / VT-3	Six EVT-1 exams completed to satisfy BWRVIP-183. No Recordable Indications. Six VT-3 Code ASME Section XI exams through BWRVIP-47 GUIDE TUBE EXAMS. No Recordable Indications.
	2013	EVT-1	Inspections performed on the Top Guide: 18-15, 18-19, 18-43, 18-47, 26-15, 26-47, 30-15, 30-47, 34-15, 34-47. No recordable Indications Found.
	2015	EVT-1	One beam with previous indication identified in 2009 inspected with no growth.
Core Plate (Rim, etc.)	Prior to 2003	VT-1 of surface welds and bolt tack welds on upper surfaces VT-3 of bolt and upper surface	Unit #2 6RIO (Spring 94) Inspected once 900 of plate and bolting accessible. No Recordable Indications. Following this inspection and the questionable value added, no further exams performed pending VIP recommendations.

		and cross-members	
	2003	VT-3	VT-3 of core support plate welds and core support plate, VT-3 18 of 34 Core Supports bolts from below core plate made accessible through removal of jet pumps for modification. No Recordable Indications.
	2007	VT-3	Four VT-3 Code ASME XI exams made accessible during BWRVIP-47 Guide Tube exams. No Recordable Indications.
	2009	VT-3	Three VT-3 Code ASME XI exams made accessible during BWRVIP-47 Guide Tube exams. No Recordable Indications.
	2011	VT-3	Examined Core Plate area 06-27, 38-39, 54-35 per Code ASME Section XI. No Recordable Indications
	2013	VT-3	VT-3 of SBLC piping per BWRVIP-027. No Recordable Indications.
SLC	1992	VT-3	Unit #2 5RIO (Fall 92) One side of the Standby Liquid Control Standpipe was inspected. Disassembly of the jet pumps for a Power Uprate modification made inspection possible. No Recordable Indications were found.
	2003	VT-3	VT-3 of SBLC piping per BWRVIP-027. No Recordable Indications.
	2005 to present	Enhanced VT-2	Enhanced VT-2 Per BWRVIP-27A of SLC Nozzle and Safe-End. No Recordable Indications.
	2013	VT-2	Inspected Nozzle and Safe-End of SLC. No recordable indications found.
Jet Pumps	1993	VT-1, VOL, VT-3	Riser brace welds inspected every other outage. Jet pump beam volumetric once in ten years. Remaining components (welds (VT-1), set screws (VT-3), wedges (VT-3), sensing line clamps (VT-1 & VT-

			3), tack welds (VT-1), etc are once per period. Jet pump beams replaced
	1994		Unit #2 6RIO (Spring 94) Beams replaced. One old beam found cracked in leg area. Non-rejectable gaps in setscrews reported over several outages. Unit #2 6RIO (Spring 94) cracked welds on #13 and #14 instrument lines. Repaired with clamps.
	1997		Unit #2 (Spring 97) Weld #3 baselined. No Recordable Indications.
	1999		Inspected per VIP-41, no recordable indications
	2001	VT-1	Inspected per VIP-41, excessive gaps, wedge wear and slider rod damage on various jet pumps. Auxiliary temporary spring wedges installed on Jet Pumps 03 and 17.
Riser Brace	2003	EVT-1	RB 1a, b, c and RB 2 a, b, c, d for Riser D No Recordable Indications.
	2005	VT-1	VT-1 Expanded Inspection Scope of Riser Brace welds RB-1A, B, C, D and RB-2 A, B, C, D for Jet Pump Riser K due to jet pump wedge wear. BWRVIP-41 expanded scope exam. No Recordable Indication
	2007	EVT-1	RB1a, b, c, d, and RB 2 a, b, c, d for Riser Brace F and H. Expanded scope inspections for Riser brace G due to jet pump set screw gaps. No Recordable Indications.
	2009	EVT-1	RB1a, b, c, d, and RB 2 a, b, c, d for Riser Brace C and E. No Recordable Indications.
	2011	EVT-1	RB1 A, B,C ,D exams for Riser Brace F & J. RB2 A,B,C,D exams for Riser Brace

			F & J. Riser brace J exams are from scope expansion due to JP17 set screw gap. No Recordable Indications.
	2013	EVT-1	Inspected the N2D Riser Braces RB1A, RB1B, RB1C, and RB1D. N2E Riser Braces: RB1A, RB1B, RB1C, RB1D, RB2A, RB2B, RB2C, RB2D due to scope expansion. No recordable indications found.
	2015	EVT-1	Inspected N2A Riser Braces RB1A, RB1B, RB1C, RB1D, RB2A, RB2B, RB2C, RB2D due to scope expansion. No recordable indication found.
	2017	EVT-1	Inspected N2F, N2G, N2H, N2J, N2K all RB1s and RB2s due to Single Loop Operation during cycle, No recordable indications.
Riser Pipe	2003	EVT-1	RS1 RS2 RS3 for risers C,D,E RS6 RS7 RS8 and RS9 for Riser C No Recordable Indications.
	2005	EVT-1 / VT-1	EVT-1 RS-6and RS-7 for Jet Pumps 05 and 06 for BWRVIP-41 baseline credit. BWRVIP-41 expanded scope exam VT-1 of RS-6 and RS-7 for JP08, JP12, JP19, and JP20 due to wedge wear. No Recordable Indications.
	2007	EVT-1	EVT-1 RS-6 and RS-7 JP20 Risers F and H RS-8 and RS-9 welds. RS1, RS2, RS3 for risers F, H No Recordable Indications.
	2009	EVT-1	RS1, RS2, RS3 for jet pump risers B, D, E, G, H. No Recordable Indications 24 Medium Priority RS6, RS7, RS8, RS9 original scope. Expanded scope RS6, RS7, RS8, RS9 for 18 additional exams due to wedge wear scope expansion. No Recordable Indications

	2013	EVT-1	EVT-1 exams were performed at ALL RS8 & RS9 locations. No recordable indications found. RS1, RS2, RS3, RS6, RS7,riser pipe welds were also inspected at several locations to meet BWRVIP-41 and due to scope expansion main wedge wear. No recordable indications were found in any of these locations.
	2015	EVT-1	All RS8 and RS9 weld examined. No recordable indications found. RS6, RS7, MX7 inspected on JP03, JP04. No recordable indication found.
	2017	EVT-1	All RS8 and RS9 weld examined. No recordable indications found. RS6, RS7, MX7 inspected on A Loop (JP11-20). No recordable indications found. RS1, RS2, RS3 on N2A, No recordable indications found.
Diffuser	2003	EVT-1	IN-4 and MX2 for jet pumps 07, 09, 10 DF-1 for jet pumps 07, 09, 10, 13, 14, 17, 18 DF2 inspected for jet pump 05, 06, 07, 08, 09, 10 AD-1 and AD-2 welds for all 20 jet pumps, Eight AD-2 welds from ID when inlet mixers removed. No Recordable Indications.
	2007	EVT-1	EVT-1 IN-4 JP11 and JP12 No Recordable Indications.
	2009	EVT-1	46 Medium and High Priority welds, AD1, AD2, DF1, DF2, MX2, IN4. No Recordable Indications.
	2013	UT	UT inspections were conducted for the AD1, AD2, MX2, DF1, and DF2 welds. No recordable indications were found in any of these locations. 50% coverage achieved at JPs 11, 12, 13, 16, 20 DF2 welds due to prominent vertical weld.

		EVT-1	EVT-1 inspections were conducted for the IN-4 welds at JPs 03, 04. No recordable indications were found.
	2017	EVT-1	DF1 on JPs 19, 20 and IN4 on JPs 01, 02, No recordable indications.
Adjusting Screws	2003	VT-1	Set screw gap inspection for all 20 jet pumps for pre and post modification inspection. One gap exceeded 10 mils during final inspection, spring wedge installed. Also several cracked set screw tack welds observed, Use-As-Is.
	2005	VT-1	VT-1 of set screws for those jet pumps exhibiting wedge wear or movement, JP08, JP12 (Movement only), JP19, JP20. JP19 excessive gap, auxiliary wedge installed. Two cracked tack welds observed Use-As-Is.
	2007	VT-1	VT-1 of set screws for those pumps with previous wedge wear observed in 2005, JP08, JP12, JP19. Cracked tack welds observed, Use-As-Is.
	2009	VT-1	AS1 set screw gap inspection for three jet pumps with set screws "digging into" belly band. Four AS2 exams for jet pump with existing cracked tack welds. Six exams for previously installed auxiliary spring wedges. Fourteen additional AS1 and AS2 exams based on jet pump wedge wear scope expansion. Results: • Set screw digging into belly band – JP01, JP04 (SS and VS), and JP12. • Additional cracked tack weld: JP13 • Auxiliary Spring Wedge digging into belly band – JP03 SS, JP19 SS, JP20 SS • Excessive set screw gap: JP01 • Auxiliary Spring Wedge past maximum allow travel distance

			JP03SS
			• Excessive downward vertical wedge movement: JP12
			• New auxiliary spring wedges installed
			  o JP01 SS and VS GAPS
			  o JP12 SS and VS Excessive vertical wedge movement
			  o JP03SS End of travel

	2011	VT-1	AS-1 exam all aux wedges and all AS-2 locations. Jet Pump indications include the following: ▪ Restrainer Bracket & AS-1 wear: JP12 VS &SS ▪ AS-1 wear into Belly Band (New and Additional)-JP11 SS &VS, JP16 SS, JP19 VS, JP17 VS, JP18 VS, JP10 SS &VS, JP09 VS, JP02 VS & SS, JP04 SS & VS, JP07 VS, JP08 SS, JP12 SS &VS, JP01 SS & VS, JP14 SS, JP03 SS, JP07 SS ▪ Cracked AS-2's- JP16 SS (ID & OD), JP13 SS (ID & OD), JP17 VS & SS (ID), JP15 SS (ID) ▪ AS-1 Gaps (New & Additional)- JP17 SS, JP17 VS, JP08 VS Aux Wedge Movement and Wear (New & Additional)- JP12 SS, JP14 SS, JP20 VS, JP19 SS, JP01 SS, JP03 SS
	2013	VT-1	The inspection of the AS1, AS2, and Auxiliary Wedges yielded various recordable indications (RI). All locations were inspected. Jet Pump indications that have not changed from previous outages are: • AS1: JP04 SS, JP08 SS, JP16 SS, JP10 VS, JP12 VS • AS2: JP06 SS, JP07 SS, JP15 SS, JP20 SS AS1 wear into Belly Band detected on: • Previous: JP07 SS, JP10 SS, JP11 SS, JP12 SS, JP14 SS, JP02 VS, JP04 VS, JP09, VS, JP20 VS,

			JP13 SS, JP18 VS • New: JP05 SS, JP06 SS, JP09 SS, JP03 VS, JP06 VS, JP08 VS, JP18 SS, JP13 VS AS1 Gaps found on: • Previous: JP02 SS, JP 07 VS, JP09 VS,JP14 VS, JP 19 SS, JP20 VS • New: JP05 VS AS1 Thread Wear Found on: • JP11 SS, JP12 SS, JP14 SS, JP20 SS & VS, JP19 SS • Note: Set Screw/Thread Damage found on JP20 SS and JP08 VS AS1 Set Screw Wear Found on: • JP12 SS, JP14SS, JP11 VS, JP19 SS AS2 Cracked Tack Welds Found on: • JP05 SS, JP16 SS, JP19 VS Aux Wedge Wear Found On: • JP03 SS, JP19 SS, JP14 SS & VS, JP20 SS & VS, JP01 SS & VS, JP08 VS, JP17 VS All other VT-1 component inspection yielded no recordable indications.
		VT-3	Baseline VT-3 performed as a result of installation of AVS (Anti-Vibration Solution) on five (5) Jet Pumps: JP09, JP11, JP12, JP19, JP20 AVS Gaps found on: • JP09(Gap on the left hard stop to guide vane) • JP11 (Gap on the left hard stop to guide vane) • JP12 (gap on the right C Clamp Inner face to restrainer bracket AND Point contact of left hard stop to Gusset) Slip Joint Clamp Wear Noted On: • JP 19, JP03, JP07, JP11, JP01 All other VT-3 component inspection yielded no recordable indications.
	2015	VT-1	The inspection of the AS1, AS2, and Auxiliary Wedges yielded various

			recordable indications (RI). All locations were inspected. -Max gap of 0.077" on JP01 SS. -No change to wear, no gap on JP01 VS. -Gap of 0.19" on JP03 VS. -New wear on upper and lower tack welds on JP03 SS. -New wear on upper and lower tack welds on JP04 SS. -New wear on lower tack weld on JP04 VS. -No change to wear, no gap on JP05 SS. -New wear into Belly Band, no gap on JP05 VS. -No change to wear, no gap on JP08 VS. -No change to wear, no gap on JP08 SS. -New slight wear into Belly Band on JP15 VS. -New crack in outer lower tack weld on JP15 SS. -New slight wear into Belly Band on JP18 VS. -New condition, no gap on JP20 SS. -New growth on inside up tack weld crack on JP20 SS. Wear of Aux wedges on JP02 VS, JP03 SS, JP04 VS, JP04 SS, JP14 VS
	2017	VT-1	Inspection on all AS-1 and AS-2 except where Aux wedges and AVS are. Results are: -No change to wear, no gap on JP05 VS and SS. -No change to wear, no gap on JP08 VS. -No change to wear, no gap on JP08 SS. -No change on JP12 VS and SS. -No change on JP13 VS and SS. -No change in wear, both tack welds cracked on JP14 SS. -No change on JP15 VS and SS. -No change on JP16 SS. -Inside upper and outside tack welds are cracked and set screw has rotated CCW

			~30 degrees on JP18 SS. New wear of Aux wedges on JP02 VS and SS, JP07 VS, JP14 VS, JP17 SS.
Assembly	2003	EVT-1	Labyrinth Seal EDM cutting modification performed on all 20 jet pump inlet mixers. Damaged wedge assemblies replaced. Damaged rods replaced. Restrainer brackets resurfaced. Post modification inspection on inlet mixer, set screw gaps and wedge heights. Post modification inspection revealed 3 inlet mixers with uneven EDM burn due to non-conductive material in mixer. Use-As-Is.
	2005	VT-1	VT-1 of all 20 Jet Pump wedges, WD-1 exam and replacement hardware installed in 2003, (wedge rods and auxiliary clamp) for 1 cycle inspection for damage from labyrinth seal modification in 2003. Moderate wedge wear in JP19. Slip Joint clamp installed to reduce vibration. Minor wedge damage in JP08, JP19, and movement noted for JP12 wedge. All Use-As-Is. Expanded inspection scope for damage to riser brace and piping for those Jet Pumps with wedge damage or movement. No Recordable Indications. .
	2007	VT-1	VT-1 of all 20 Jet Pump wedges and rods, WD-1 exam and replacement hardware, one auxiliary spring wedge, installed in 2005. Minor wedge wear on 6 jet pumps. Expanded visual exams revealed large gap at one set screw for two jet pumps. Auxiliary spring wedges for both vessel side and shroud side installed. Minor rod wear observed on 14 rods. Major wear on 2 rods, for one cycle to be replaced next outage. Cracked tack welds and indentations into belly band Use-As-Is

			Auxiliary spring wedge installed in 2005 at end of travel. New spring wedge installed in place.
	2009	VT-1	VT-1 of all 20 wedges to support EPU and determine if additional wedge wear has occurred. Scope expansion required for two jet pumps due to wear or wedge movement. • Additional minor wedge and/or rod wear for 13 jet pumps - JP01, JP02, JP03, JP04, JP07, JP09, JP11, JP12, JP13, JP15, JP18, and JP20.
	2011	VT-1	VT-1 of all 20 wedges due to wedge wear observed in 2009 and EPU. Movement and Wear- JP18, JP17, JP02, JP03, JP07, JP08, JP09, JP10, JP04, JP06
		VT-1	VT-1 of Jet Pump 12 Lab Seal during main wedge replacement. Slip Joint ID wear pattern: area between SS AS-1 & VS AS-1 Noticeable Wear on the outside of riser pipe location. Wear on Lab Seal found wear in the restrainer bracket observed while wedge was removed. Significant wear & damage on set screws (SS & VS). Inspected while aux. wedges were removed. No wear pattern at main wedge location. Scope expansion to remove aux. wedges at two additional jet pumps to inspect set screws for wear. Additional wear found at both jet pumps.
	2013	VT-1	VT-1 performed on ALL Main Wedges. New and changes in previous wedge wear Is noted in the first bullet point, the second bullet point indicates Jet Pumps with both Main Wedge Wear and Rod Wear: • JP11, JP14, JP08, JP10

			• JP12, JP13, JP17, JP18, JP19, JP20, JP01, JP02, JP03, JP04, JP05, JP06, JP09 Main Wedge Movement noted on the Jet Pumps in the first bullet, Rod movement on Jet Pumps in the second bullet: • JP01, JP03, JP06, JP08, JP10, JP12, JP13, JP14, JP15, JP16, JP18, JP20 • JP02, JP05, JP09, JP17, JP19 Recordable Indications with No Change for the Main Wedge are: • JP04, JP07 It should be noted that there was no recordable indication found on the JP12 Beam Tack Welds
		VT-3	VT-3 Inspections were performed on the Slip Joints and at Inlet Mixer- RPV wall Shrouds wall elevations on JPs 01, 02, 11, 12 to detect pitting. Indications were found on the Slip Joints. New and Previous Slip Joint Gaps were found on: • JP01, JP02, JP03, JP06, JP07, JP10, JP11, JP12, JP13, JP14, JP15, JP16, JP17, JP19 Diffuser collar Wear from Slip Joint Clamps was discovered on JP01 and JP03 No recordable indications were found on the remaining Slip Joints. No recordable indications were found on any of the Inlet Mixer-RPV wall, Shroud wall elevations on JP01 JP02, JP11, and JP12.
	2015	VT-1/ VT-3	Slip Joint Clamp new wear on JP01, JP03, JP04, JP09, JP11, JP15, JP16, JP17, JP18, JP20. New Slip Joint Clamp with increased pre-load on JP01, JP03, JP04, JP16, JP17, JP18. Increased pre-load on JP02, JP05, JP06, JP08, JP10, JP13, JP14, JP15. All AVS inspected with minor indications

			on JP09, JP12, JP19, JP20. New AVS installed on JP01, JP03, JP04. All main wedges inspected. Significant damage of main wedge on JP03, JP04, JP19. Main wedge removed on JP03, JP04, JP19. New ratchet hold down beam on JP01, JP03, JP04.
	2017	VT-1/ VT-3	Inspections of AVS: -New Slight gap on Right Hard Stop on JP04 -New gap at Right Hard Stop on JP09 -No change to gap, Hard stop frame top is disengaged from hard stop frame bottom, Wear into hard stop restraint arm and restrainer bracket left restraint arm ratchet teeth worn away and not engaged on JP12 -Very slight gap between hard stop and vane that was not reported during previous examination, no apparent change to previously identified gap on JP20 Inspections of Main Wedges: -New movement downwards and wear on JP01, JP02, JP10, JP14, JP17, JP18 -No wedge on JP03, JP04, JP09, and JP19 -New slight movement downward on JP05, JP15, JP16 -No change to JP06, JP07, JP12, JP13 -New wear on JP08, JP20 -New slight wear on JP11 Inspections of Slip Joint Clamps: -Additional wear and not level on JP01 -No change on JP03 -New wear at mid-strut into diffuser collar on JP04 -No change to JP07 -Previous wear more visible due to gap in strut on JP09 -New wear at mid-strut into diffuser collar on JP11 -New no contact between the mid-vane

			and slip joint clamp on JP13 -No change in wear pattern at jacking bolt strut on JP14 -New wear at mid-strut into diffuser collar on JP15 -No contact at middle vane to SJC, new wear into the ear at the collar, and possible evidence of jacking bolt movement and movement and wear into diffuser at mid-support on JP16 -New wear at mid-strut into diffuser collar on JP17 -New wear into the diffuser collar at the mid-strut on JP19 -No change on JP20
Sensing Line	2003	VT-3	Inspection of two Jet Pump sensing lines welds and supports per BWRVIP-041 and Power Uprate. No Recordable Indications.
	2005	VT-3	VT-3 for sensing lines with clamps installed for power up-rate vibration considerations or defect mitigation. No Recordable Indications.
	2007	VT-3	Inspection of two Jet Pump sensing lines welds and supports per BWRVIP-041 and Power Uprate. No Recordable Indications
	2009	VT-3	VT-3 for sensing line clamps due to Power Uprate vibration consideration or defect mitigation. Crack detected in support to line weld, Lack of Contact between clamp and pipe and evidence of movement.
	2011	VT-3	VT-3 of sensing lines for EPU vibration considerations. No Recordable Indications. VT-3 of sensing line clamps inspected in 2009 to determine if any change in condition. One clamp showed additional lack of contact, two clamps showed additional movement.

	2013	VT-3	Inspection performed for the calibrated Jet Pump Lines. The Calibrated Jet Pumps are JP05, JP10, JP15, and JP20. No Recordable Indications were found on the calibrated JP lines. VT-3 inspections were also performed on the clamp only for the JP01, JP02, JP10, JP11, JP12, JP13, JP14, AND JP20 instrumentation lines. Indications were found on the JP11, JP13, and JP20. • JP11 has an indication which had no change and no growth from 2011. • JP13 had additional movement and wear on the clamp pads and lower standoff bracket along with a cracked weld (on the shroud side) where the clamp is installed. • JP20 had a clamp pad gap on the lower right vessel side and lower left shroud side where the clamp is installed. No other Jet Pumps had recordable indications.
	2017	VT-3	Instrument line clamp inspection performed on JP01, JP02, JP10, JP13, JP14 -gap at the stand-off to hook interface found on JP10 -gap between the upper vessel side foot and jet pump diffuser. Slight additional movement up on all of the other clamp feet on JP13 No recordable indications on JP01, JP02, JP14. Instrument line inspection performed on all JPs. No recordable indications.
JP Beams	2005	UT	UT exam for all 20 Jet Pump beams, BB-1, BB-2, BB-3 regions per BWRVIP-41. No Recordable Indications.

	2011	UT	UT exam for all 20 Jet Pump beams, BB-1, BB-2, BB-3 regions per BWRVIP-41. No Recordable Indications.
	2013	VT-1	Inspected the N2F Beam Tack Welds on JP12. We found no recordable indications.
	2017	UT	UT 100% of Group 2 Jet Pump Beams. No Recordable Indications.
CRD Guide Tubes	2003	EVT-1 and VT-3	EVT-1 and VT-3 of CRGT-1, -2, -3 and FS/GT-ARPIN on 9 guide tubes. No Recordable Indications.
	2007	EVT-1 and VT-3	EVT-1 and VT-3 of CRGT-1, -2, -3 and FS/GT-ARPIN on 4 guide tubes. No Recordable Indications
	2009	EVT-1 and VT-3	EVT-1 and VT-3 of CRGT-1, -2, -3 and FS/GT-ARPIN on 4 guide tubes. No Recordable Indications
	2011	EVT-1 and VT-3	EVT-1 and VT-3 of CRGT-1, -2, -3 and FS/GT-ARPIN on 3 guide tubes. No Recordable Indications
CRD Guide Tubes OD	2003	VT-3	Inspected 52 CRD Guide Tubes OD in lower plenum periphery made accessible through removal of jet Pumps for modification per BWRVIP-47 guidelines. No Recordable Indications.
	2011	VT-3	Inspected 3 CRD Guide Tubes OD in lower plenum made accessible during jet pump modifications. No Recordable Indications.
		VT-3	Inspected 3 stub tubes and attachment weld to RPV. No Recordable Indications. VT-3 of 40 stub tubes and attachment welds to RPV per BWRVIP-47 guidelines. No Recordable Indications.

Dry Tubes	Prior to 2003	VT-1	VT-1 inspections of 3 dry tubes per SIL-409. One tube plunger separated and missing from tube. One tube linear indication in creviced area. Both damaged tubes replaced.
	2003	VT-3	VT-3 examination of remaining 9 dry tubes to determine if plungers still present. No Recordable Indications.
	2005	VT-3	VT-3 examination of remaining 6 dry tubes to determine if plungers still present. No Recordable Indications.
Instrument Penetrations	1986 to 2011	VT-2	VT-2 Exams during RPV pressure test each outage.
	2013	VT-2	VT-2 Exams performed during the RPV pressure test. No recordable indications found during the inspection.
Vessel ID Brackets	Prior to 2005	VT-1 and VT-3	1989 Section XI inspections of jet pump riser brace, dryer, feedwater brackets, core spray header brackets, and surveillance capsule holder brackets, performed once per interval. "Measurable but acceptable wear" VT-3 Examinations were performed on the dryer support brackets and attachment welds located at 4, 94, 184 and 274 degrees. No new indications were observed. Previously recorded wear on support lug "D" at 274 deg. was verified and no additional wear noted. VT-3 (VT-1 beltline) exam of Guide rod Bracket, Steam Dryer Hold down brackets, Surveillance Brackets. EVT-1 of seven sets of Jet Pump Riser Brace to Pad Welds and EVT-1 of all eight Core Spray Brackets to RPV attachment welds. All inspections per BWRVIP-048
	2005	VT-3	VT-3 of one Steam Dryer Hold Down Bracket per ASME XI / BWRVIP-48. No

			Recordable Indications.
	2007	VT-3	VT-3 of 274 degree dryer support bracket. Bracket wear was never quantified during prior exams. Expanded scope to other dryer support brackets. No Recordable Indications.
		EVT-1 / VT-3	Two Jet pump riser support brackets to vessel. Eight feedwater bracket to vessel welds. No Recordable Indications.
		VT-1 / VT-3	Guide Rod brackets No Recordable Indications.
	2009	EVT-1	EVT-1 of six jet Pump riser support bracket to vessel welds (three pair)
		VT-1/ VT-3	Three surveillance specimen brackets. No Recordable Indications.
		VT-3	One each Dryer Hold down bracket and Guide Rod Bracket. Minor rubbing/wear marks on guide rod. All attachment welds, No Recordable Indications.
		EVT-1/ VT-3	Dryer Support Brackets (four) Pre and post EDM to support EPU new dryer VT-3 to establish new baseline. EVT-1 post EDM of bracket surface and EVT-1 of bracket to vessel welds. No Recordable Indications.
	2011	VT-3	VT-3 of Guide Rod Bracket with minor rubbing identified in 2009. No change from condition reported in 2009.
		VT-3	VT-3 of four Dryer Hold down brackets. No Recordable Indications
		VT-3	VT-3 of four Dryer Support Brackets to identify wear patterns
		VT-1	VT-1 of four Dryer Support Brackets weld to RPV. Required by new dryer manufacturer for new steam dryer.

	2013	VT-1	Inspection of the Surveillance Specimen Bracket 1B was performed and the engagement of the surveillance bracket was verified. No recordable indications were discovered.
		VT-3	Inspection of the Surveillance Specimen Brackets 1A, 2A, 2B, 3A, 3B was performed to verify engagement of the specimen bracket only. No recordable indications were found.
	2015	VT-3	Inspection of the Surveillance Specimen Bracket 1A, 1B, 2A, 2B, 3A, 3B was performed and the engagement of the surveillance bracket was verified. No recordable indications were discovered.
		EVT-1	Dryer Support bracket welds inspected. No relevant indications.
		VT-1	Dryer Support bracket tops were inspected. Wear noted on top of bracket. Rolled metal on top removed.
		VT-3	Dryer Support bracket overview. No relevant indications.
	2017	VT-3	Inspection of the Surveillance Specimen Bracket 1A, 1B, 2A, 2B, 3A, 3B was performed and the engagement of the surveillance bracket was verified. No recordable indications were discovered.
		EVT-1	Dryer Support bracket welds inspected. No relevant indications.
		VT-1	Dryer Support bracket tops were inspected. Wear noted on top of bracket.
		VT-3	Dryer Support bracket overview. No relevant indications.
LPCI Coupling	N/A	N/A	Not applicable to this plant

Steam Dryer	2005	VT-1	VT-1 exam of all steam dryer components per GE SIL 644 Rev. 1 and BWRVIP-139 in anticipation of EPU. Inspections included Hood Panel Welds, Lifting Lugs, Drain Channel Welds, Hood/End Panel Welds, Steam Dam to Hood Joint Welds, Tie Bar Welds, Vane Bundle to Vane Assembly, and all previously identified indications. Minor growth in existing minor IGSCC cracks some new IGSCC minor cracks in Drain Channel and Hood/End Panel Welds. Existing Vane Bundle Assembly to Seam Dam weld grew in length from 10" in 2003 to 14" in 2005. Entire flaw length repaired through underwater welding.
	2007	VT-1	VT-1 of welds with previous indications and those weld types with defects that required weld repair last two outages. Minor growth in lifting lug tack weld. Acceptable. No other growth or defects noted.
	2009	VT-1	VT-1 Baseline post-construction of new steam dryer. No Recordable Indications.
	2011	VT-1/ VT-3	Baseline exams of new steam dryer after one cycle. Exams include all BWRVIP-139 components and additional locations required by the manufacture, including underside exams. Major Indications: Dryer Seismic Ring Lug A- Through-Wall indication in Skirt Panel—Approx 4.5" Repaired though stop drill repair. Dryer Lug LL-B 140 Deg- Crack-like Indication on Dryer lower Bracket to Lifting Lug Weld– Approx. 0.5". Multiple IGSCC indications (4 areas) found during VT-1 of Dryer Skirt Weld 135 Deg- most prominent cracks are 0.5"- shallow depth. Use-as-is.
	2013	VT-1/ VT-3	100% of the Steam Dryer locations specified in BWRVIP-139 along with locations that GEH recommended to look

			at for EPU was inspected in 2013. The New Indications are as follows: • Dryer 320 DEG Lifting Lug to Eye Fillet Weld has a crack on the 090 DEG Fillet Weld of approximately 1 ¾". • The 140 DEG Lifting Lug to Eye Fillet Welds has a fully cracked 090 DEG weld and a not fully cracked 000 DEG weld. • Dryer Hood A has a staining crud swirling pattern, a grinding mark, and possible denting of the hood. Dryer Hood F has a similar swirl pattern but no denting. • Lower Bracket, Lug LL-C (220 DEG) and Lug LL-D (320 DEG) • Middle Bracket have IGSCC Indications of 7/16" and ½" respectively in the Upper HAZ • The Dryer Skirt has two new gouges at 180 DEG and four new anomalies at 098,097,096 Degrees. • The Dryer Weld DC-C-2 has an axial indication of HAZ of approximately 0.55" long. • The Left side of the Skirt Panel at 180 DEG has an area of interest/non-service induced "Punch Mark". • The Left side of the 000 DEG Skirt Panel has two indications on the ID Dryer at the intersection of the skirt weld T-piece and the T-piece to support the ring area. The indications that were found previously include: • Growth to 5/8" in 2013 from an indication of the Dryer LL-B 140 DEG Lower Bracket found in 2011. • Underside of Seismic Support Lug D shows signs of 100% contact with support bracket. • Dryer Skirt 4 DEG Mid Support

			Ring ID and Dryer Skirt Defect Removal Area shows no change from drill hole mitigation in 2011. • The Dryer Skirt 135 DEG Weld indication shows additional growth from previous indications. • The Dryer Skirt has a previous abnormality that did not change from 2011, but a new indication sprouted on the mid-support ring at 42 DEG. • The Dryer Support Brackets A, B, and C and a Dryer Weld SN-B-2 indication shows no change and no growth from 2011. All other indications are none recordable. The Dryer Support Bracket D (274 DEG) shows metal rollover from side shot and top surface has contact with seismic ring lug D. Support Lugs A, B, & C show no change and no growth from 2011.
	2015	VT-1/ VT-3	100% of the Steam Dryer locations specified in BWRVIP-139 along with locations that GEH recommended to look at for EPU was inspected in 2015. Indications found: a. Dryer 140 degree lifting lug 180 degree fillet weld has no change in crack length, has additional pitting. b. Dryer 140 degree lifting lug lower bracket, top, has new crack growth to 13/16 inch. c. Dryer 140 degree lifting lug lower bracket, bottom, has new indication below bracket measuring approximately 1 inch in length. d. Dryer 220 degree lifting lug to eye fillet welds has new crack on 0 degree fillet weld and measures approximately 7/8 inches in length. e. Dryer 320 degree lifting lug to eye fillet weld has new crack on the 90 degree side fillet weld and is approximately 7/8 inches in length.

			f. Dryer 320 degree lifting lug to eye fillet weld has new on the 270 degree side fillet weld and is approximately ½ inches in length. g. Dryer Skirt 090-180 degrees has new indication at the lower existing gouges. h. Dryer Skirt at Seismic Lugs C has new indication in weld at corner that has crack like characteristics and measured at 0.46 inches. i. Dryer Skirt Weld 135 degrees has new growth in area 1 of approximately 0.82 inches. Area 2 has new growth branching off on the left side with a growth of approximately 0.18 inches. Area3 has new growth of approximately 0.45 inches. j. Dryer Support Bracket A 004 Degrees has additional wear. k. Dryer Seismic Ring Lug A 004 Degrees has slight change in contact pattern. l. Dryer Support Bracket D 274 Degrees has additional wear. m. Dryer 40 Degree Lifting Lug Fillet Weld at 270 degree side has new indication on each corner of the fillet weld, left indication is 5/16" and right indication is 3/16". n. Dryer 40 Degree Lifting Lug Fillet Weld at 180 degree side has new indication on left corner and is 1/16".
	2017	VT-1/ VT-3	Inspection of previous defects on steam dryer. New growth on indications found: -New crack growth on Skirt Panel 0 degree Left Side -Change in color of wear pattern on all seismic ring lugs -New crack growth on the Skirt at Lug C -New crack growth at two locations on Skirt Weld 135 degrees -New change in color of the swirl patterns on Hood A and F

			-New crack growth of approximately 1 1/16"on 140 degree lifting lug lower bracket, no apparent change to other indication on Dryer lifting lug assemblies.
Steam Separator	2007	VT-1	VT-1 of 25% of support ring to gusset welds. Minor IGSCC cracks found in 9 welds. Use-As-Is.
	2007	VT-3	VT-3 of all tie bars. Two severed tie bars found, loose ends cut back to attachment welds.
	2009	VT-1	VT-1 of additional 25% of support ring to gusset welds. Minor IGSCC cracks found in 19 welds. Use-As-Is. Nine re-looks at welds with previous indications, no growth detected.
	2011	VT-1	VT-1 of previous IGSCC indications. Additional minor IGSCC discovered at two gusset welds. Use-as-is.
	2013	VT-1	All VT-1 Inspections performed on the moisture separator gusset welds yielded recordable indications. The following indications have been discovered in previous outages but have not showed growth in 2013: • The Lower Gusset Weld to Pipes: A04, B08, F14, H16, A02, M01, O01, R01, R04 • The Upper Gusset Weld to Ring: A04, B08, E13, A02, F01, H01, Q01, M15, Q09, R06 The Following indications have been discovered in past outages and have shown growth in 2013: • The Lower Gusset - C11 Weld to Pipe grew approximately ¼ inch on the 180 DEG side • The Lower Gusset - F01 Weld to Pipe grew by 1/4 inch • The Lower Gusset O13 Weld to Pipe grew by 1/8 inch

			• The Upper Gusset – J16 Weld to Ring grew by 1/8 inch • The Upper Gusset – O13 Weld to Ring had outside growth by 1 inch. New recordable indications found in 2013 are: • The Upper Gusset – C01 weld to Ring has an approximately 11/16 inch indication • The Tie Bar connection J12 to I12 was deformed at the J12 Weld, both J12 Welds were cracked and the J13 to J12 Tie Bar is Bent. All other inspected items yielded no recordable indications.
		VT-3	VT-3 preformed on the Separator Tie Bars and it was observed that: • The P1 to O1 is bent and broken on the P1 side • The P1 to O2 is Bent • The H1 to I1 is Bent All other inspected separator tie bars had no recordable indications.
	2015	VT-1/ VT-3	Inspected Gusset welds and Tie bars with previous indications: -Support Ring Lower Gusset C11 Weld to Pipe -Support Ring Lower Gusset F01 Weld to Pipe -Support Ring Lower Gusset O13 Weld to Pipe -Support Ring Upper Gusset C01 Weld to Pipe -Support Ring Upper Gusset J16 Weld to Pipe -Support Ring Upper Gusset O13 Weld to Pipe -P1 to O1 Tie bar -P1 to O2 Tie bar -H1 to I1 Tie bar -J12 to I12 Tie bar -J13 to I12 Tie bar No change to indications.

			K12 Tie Bar to K11 was found to have a slight bend.
	2017	VT-1/ VT-3	Inspected 25% of Gusset welds and standpipe to dome welds. No recordable indications on standpipe to dome welds. Inspected 10 Shroud Head Bolts due to previous indications. -No new wear on SHB 04, 05, 10, 14, 27, 29, 32 -New window wear on SHB 39 -New witness marks on bottom of upper collar and slight change in wear in window on SHB43 -New wear in window and on the pin, additional wear on top and below upper support ring, wear at mid-support ring on SHB 47 No change to following indications: -A04 Lower Gusset to Pipe -B08 Lower Gusset to Pipe -F14 Lower Gusset to Pipe -H16 Lower Gusset to Pipe -A04 Upper Gusset to Ring -B08 Upper Gusset to Ring -E13 Upper Gusset to Ring
Feedwater Spargers and Brackets	2007	VT-1 / VT-3	VT-1 of feedwater sparger welds and nozzles. VT-3 of brackets for OE for pin wear into bracket top. No Recordable Indications.
	2011	VT-3	VT-3 of all twelve brackets for pin wear. Minor pin wear found on four brackets. Use-as-is.
	2013	VT-3	Inspected the N4A, N4B, N4C, N4D, N4E, and N4F Sparger Bracket 1 and Sparger Bracket 2. Recordable Indications were found as follows. Top Bracket Pin Wear that is more pronounced than the wear discovered in U2-15RIO in the N4C Sparger Bracket 1. The underside of N4E Sparger Bracket 2 also shows wear. The N4A Sparger Bracket 2

			and N4F Sparger Bracket 1 are recordable indications but have not grown since U2-15RIO. All other indications are non-recordable.
	2015	VT-1/ VT-3	Inspected the N4A, N4B, N4C, N4D, N4E, and N4F Sparger Bracket 1, Sparger Bracket 2 and nozzles. Recordable Indications were: a. Feedwater Sparger N4C 2S nozzle is cracked in 2 places.
	2017	VT-1/ VT-3/ EVT-1	No change to cracks in the Feedwater Sparger N4C 2S nozzle Inspected N4A, N4B, N4C, N4D, N4E, N4F bracket welds both VT-3 and EVT-1, No recordable indications.
Miscellaneous DM Welds	2009	UT	During the U2-14RIO, fifteen (15) dissimilar metal (DM) IGSCC Category C welds containing Alloy 82/182 weld material and two (2) IGSCC Category C welds containing stainless steel weld material were examined to the requirements of ASME Section XI, Appendix VIII, Supplement 10, using automated ultrasonic equipment or manual ultrasonic examination. No failures were identified. Additionally, one IGSCC Category C weld was modified to an IGSCC Category A weld during the outage, decreasing the total Susquehanna Unit 2 IGSCC Category C population from 22 to 21.
	2011	UT	U2-15RIO six (6) dissimilar metal (DM) IGSCC Category C welds containing Alloy 82/182 were examined to the requirements of ASME Section XI Appendix VIII, Supplement 10.
	2017	UT	U218RIO – During the U2-18RIO, two dissimilar metal (DM) IGSCC Category C welds were examined to the requirements of ASME Section XI, Appendix VIII, Supplement 10, using

			automated ultrasonic equipment. No failures were identified.