Progress Energy

Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 50.55a

March 20, 2009
3F0309-01

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 – Third Ten-Year Inservice Inspection (ISI) Interval Relief Requests #09-001-II, #09-002-II and #09-003-II

Dear Sir:

Pursuant to 10 CFR 50.55a(g)(5)(iii), Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc., hereby submits Relief Requests #09-001-II and #09-002-II. In addition, pursuant to 10 CFR 50.55a(g)(6)(ii)(A)(5) and 10 CFR 50.55a(a)(3)(i), FPC hereby submits Relief Request #09-003-II. The purpose of these relief requests is to seek approval for limited volumetric examinations performed on ASME Code Class 1 piping and nozzles, ASME Code Class 2 piping and nozzles, and on the ASME Code Class 1 Reactor Pressure Vessel Shell, respectively, during the Crystal River Unit 3 (CR-3) Third Ten-Year Inservice Inspection (ISI) Interval. These examinations covered less than 90 percent of the weld volume required to be examined by the ASME Boiler and Pressure Vessel Code, Section XI, 1989 Edition, no Addenda. These examinations were limited due to geometry or by interferences with other components.

The Third Ten-Year ISI Interval for CR-3 ended on August 13, 2008. FPC is requesting approval of these relief requests prior to August 14, 2009.

No new regulatory commitments are made in this submittal.

If you have any questions regarding this submittal, please contact Mr. Dan Westcott, Supervisor, Licensing and Regulatory Programs at (352) 563-4796.

Sincerely,

Stephen J. Cahill
Manager, Engineering
Crystal River Nuclear Plant

SJC/dwh

Enclosures:
1. Relief Request #09-001-II
2. Relief Request #09-002-II
3. Relief Request #09-003-II

xc: NRR Project Manager
Regional Administrator, NRC Region II
Senior Resident Inspector

A047
NRR

Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ENCLOSURE 1

INSERVICE INSPECTION
RELIEF REQUEST #09-001-II
THIRD TEN-YEAR ISI INTERVAL

10 CFR 50.55a Request #09-001-II
Relief Request
in Accordance with 10 CFR 50.55a(g)(5)(iii)

--Inservice Inspection Impracticality--

1. ASME Code Component(s) Affected

ASME Code Class 1 Piping and Nozzles

Categories: B-D, B-J, B-M-1 and R-A

Items: B3.110, B3.120, B3.130, B3.140, B9.21, B12.40 and R1.20.

2. Applicable Code Edition and Addenda

American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, Section XI, 1989 Edition, no Addenda

3. Applicable Code Requirement

ASME Code, Section XI, Sub-article IWB-2500, states, in part, "Components shall be examined and tested as specified in Table IWB-2500-1." Table IWB-2500-1 requires an examination of applicable Class 1 pressure retaining-welds, which includes 100 percent of weld length once during the ten-year ISI interval for the following Code Categories:

Category B-D:	Items B3.110, B3.120, B3.130 and B3.140
Category B-J:	Items B9.21
Category B-M-1:	Items B12.40
Category R-A:	Items R1.20

A risk-informed in-service inspection (RI-ISI) program for Crystal River Unit 3 (CR-3) was approved by the NRC on September 20, 2005. The RI-ISI was developed for Class 1 piping welds for the Category B-F and B-J circumferential piping welds in a manner consistent with ASME Code, Section XI, Code Case N-578. Code Case N-578 requires 100 percent of the required volume of the weld and adjacent base material to be examined for Examination Category R-A, Item R1.20.

Code Case N-460 permits a reduction in examination coverage of Class 1 and Class 2 welds, provided the coverage reduction is less than 10 percent. CR-3 has adopted Code Case N-460 in the Inservice Inspection (ISI) Program Plan, as permitted by NRC Regulatory Guide 1.147, Revision 15, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1."

4. Impracticality of Compliance

At the time CR-3 was constructed, the ASME Boiler and Pressure Vessel Code only addressed nuclear vessels and associated piping up to and including the first isolation valve. The piping codes of record were USAS B31.7, 1968 Edition for nuclear piping, and USAS B31.1.0-1967 Edition for non-nuclear piping.

10 CFR 50.55a recognizes the limitations to in-service inspection of components in accordance with Section XI of the ASME Code that are imposed due to early plants design and construction, as follows: 10 CFR 50.55a(g)(1), "For a boiling or pressurized water-cooled nuclear power facility whose construction permit was issued prior to January 1, 1971, components (including supports) must meet the requirements of paragraphs (g)(4) and (g)(5) of this section to the extent practical." 10 CFR 50.55a(g)(1) is applicable since the CR-3 construction permit was dated September 25, 1968.

10 CFR 50.55a(g)(4) states, "Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) which are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements, except design and access provisions and pre-service examination requirements, set forth in Section XI of editions of the ASME Boiler and Pressure Vessel Code ... to the extent practical within the limitations of design, geometry and materials of construction of the components."

10 CFR 50.55a(g)(5)(iii) states, "If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4, information to support the determinations." CR-3 has determined that the following welds were limited from achieving greater than 90 percent of the required examination volume for in-service examinations due to component configuration or physical barriers, which would require a major modification to the existing hardware.

Therefore, relief is being sought from coverage requirements set forth in ASME Code, Section XI, Sub-article IWB-2500, in accordance with 10 CFR 50.55a(g)(5)(iii). Relief is requested from performing volumetric examinations of the welds listed in Table A to the extent required by the Code. These examinations are limited by part geometry or interferences with other components such that the reduction in coverage is greater than 10 percent.

TABLE A

*CC/S = clad carbon steel

**S/S = stainless steel

Category	Item	Summary Number	Diameter	Thickness	Material	Coverage Percentage	Description
B-D	B3.110	B2.2.1A	N/A	4.75"	CC/S*	50	Nozzle To Head Welds
		B2.2.2A	N/A	4.75"	CC/S	50	Nozzle To Head Welds
		B2.2.3A	N/A	4.75"	CC/S	50	Nozzle To Head Welds
		B2.2.4A	N/A	4.75"	CC/S	56	Nozzle To Head Welds
	B3.120	B2.2.1B	N/A	5.0"	CC/S	42	Nozzle Inner Radius
		B2.2.2B	N/A	5.0"	CC/S	42	Nozzle Inner Radius
		B2.2.3B	N/A	5.0"	CC/S	42	Nozzle Inner Radius

Category	Item	Summary Number	Diameter	Thickness	Material	Coverage Percentage	Description
		B2.2.4B	N/A	5.0"	CC/S	48	Nozzle Inner Radius
	B3.130	B3.2.1	N/A	8.4"	CC/S	46	Steam Generator Nozzle To Head Weld.
		B3.2.2	N/A	8.4"	CC/S	63	Steam Generator Nozzle To Head Weld.
		B3.2.3	N/A	8.4"	CC/S	50	Steam Generator Nozzle To Head Weld.
		B3.2.4	N/A	8.4"	CC/S	46	Steam Generator Nozzle To Head Weld.
		B3.2.5	N/A	8.4"	CC/S	63	Steam Generator Nozzle to Head Weld
		B3.2.6	N/A	8.4"	CC/S	49	Steam Generator Nozzle to Head Weld
	B3.140	B3.2.1.1	N/A	8.4"	CC/S	61	Nozzle Inner Radius
		B3.2.2.1	N/A	8.4"	CC/S	48	Nozzle Inner Radius
		B3.2.3.1	N/A	8.4"	CC/S	43	Nozzle Inner Radius
		B3.2.4.1	N/A	8.4"	CC/S	61	Nozzle Inner Radius
		B3.2.5.1	N/A	8.4"	CC/S	48	Nozzle Inner Radius
		B3.2.6.1	N/A	8.4"	CC/S	43	Nozzle Inner Radius
B-J	B9.21	B4.5.62	2.5"	.375"	S/S**	50	Valve to Pipe
		B4.5.71.3	2.5"	.375"	S/S**	50	Valve To Pipe
		B4.5.71.4	2.5"	.375"	S/S	50	Pipe to Safe End
		B4.5.79.4	2.5"	.375"	S/S	50	Valve to Pipe
		B4.5.79.5	2.5"	.375"	S/S	50	Pipe To Safe End
		B4.5.84.2	2.5"	.375"	S/S	50	Valve to Pipe
		B4.5.84.4	2.5"	.375"	S/S	50	Pipe to Safe End
		B4.5.151	2.5"	.375"	S/S	50	Pipe to Tee

Category	Item	Summary Number	Diameter	Thickness	Material	Coverage Percentage	Description
		B4.5.165	2.5"	.375"	S/S	50	Valve To Pipe
B-M-1	B12.40	B6.6.7	14"	.750"	S/S	0	Valve Body To Canopy
R-A	R1.20	B4.5.108.17 (RI-ISI)	4.0"	.438"	S/S	50	Elbow To Valve

Examination Details

B3.110 Pressurizer Nozzle-to-Head Welds: B2.2.1A, B2.2.2A, B2.2.3A and B2.2.4A

The pressurizer nozzle-to-vessel head welds are accessible only from the head side, based on the nozzle curvature. The scanning surface of the nozzle is perpendicular to the head surface, which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will integrate the weld volume for in-service flaws. The non-destructive examination (NDE) techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the Performance Demonstration Initiative (PDI) for examination of the subject vessel welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

B3.120 Pressurizer Nozzle Inside Radius: B2.2.1B, B2.2.2B, B2.2.3B and B2.2.4B

The pressurizer nozzle inside radii are accessible only from the head side, based on the nozzle curvature. The scanning surface of the nozzle is perpendicular to the head surface, which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will integrate the area volume for in-service flaws. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the subject vessel welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

B3.130 Steam Generator Nozzle-to-Head Welds: B3.2.1, B3.2.2, B3.2.3, B3.2.4, B3.2.5 and B3.2.6

The steam generator nozzle-to-vessel head welds are accessible only from the head side, based on the designed nozzle configuration. The proximity of the nozzle radius prevented examination coverage from the nozzle side. Scanning was performed from the nozzle. However, the ultrasonic waves did not cover the Code required examination volume at an angle that will integrate the weld volume for in-service flaws. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the subject welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

B3.140 Steam Generator Nozzle Inside Radius: B3.2.1.1, B3.2.2.1, B3.2.3.1, B3.2.4.1, B3.2.5.1 and B3.2.6.1

The steam generator nozzle inside radii are accessible only from the head side, based on the designed nozzle configuration. The proximity of the nozzle outer radius prevented examination coverage from the nozzle side. Scanning was performed from the nozzle. However, the ultrasonic waves did not cover the Code required examination

volume at an angle that will integrate the area volume for in-service flaws. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the subject welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

B9.21 Circumferential Pipe Welds: B4.5.62, B4.5.71.3, B4.5.71.4, B4.5.79.4, B4.5.79.5, B4.5.84.2, B4.5.84.4, B4.5.151 and B4.5.165

The ultrasonic examination of the above pipe welds was limited in coverage due to component configuration and/or immovable physical barriers. It is not possible to perform the ultrasonic examination from both sides of the weld since one side of the weld was not suitable for scanning based on the scanning surface angle of the component. Therefore, the welds only received a single sided examination or partial single sided examination resulting in less than 90 percent coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

B12.40 Valve body Weld: B6.6.7

Ultrasonic examination of the above valve to body weld could not be performed due to being inaccessible. The valve would require disassembly for access to the weld. Relief is being sought on the basis that, due to the design of the valve, disassembly of DHV-3 is required for access to the weld, including the removal of a weld joining the clamp to the yoke holding the upper assembly. DHV-3 had a history of pressure seal ring leakage. Due to the significant consequences of the leakage (DHV-3 is the first isolation valve between the Reactor Coolant System and the Decay Heat System and contains the only weld of this type at CR-3), a modification was implemented during the Third Ten-Year ISI Interval to eliminate the pressure seal ring joint. A canopy was installed over the pressure seal ring joint with Summary Number B6.6.7 being the identifier of the resultant valve body weld. Preservice examinations consisting of ultrasonic and liquid penetrant were performed satisfactorily with no indications. (See Attachment A for representative drawings of DHV-3.)

R1.20 Circumferential Pipe Weld: B4.5.108.17 (RI-ISI)

Ultrasonic examination of the above pipe weld was limited in coverage due to component configuration and/or immovable physical barriers. It is not possible to perform the ultrasonic examination from both sides of the weld since one side of the weld was not suitable for scanning, based on the scanning surface angle of the component. Therefore, the weld only received a single sided examination or partial single sided examination resulting in less than 90 percent coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

5. Burden Caused by Compliance

In order to scan all of the required volume for these welds and inside radii, the components would have to be redesigned to allow scanning from both sides of the weld and inside radii, which is impractical. There were no recordable indications, other than geometric indications, found during the inspection of these welds and inside radii. Based on the components' designed configuration, the coverage obtained did not meet the requirements of the ASME Code, Code Case N-578 or Code Case N-460.

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested for the components listed in Table A on the basis that the required examination coverage of essentially 100 percent is impractical due to physical obstructions and the limitations imposed by design, geometry, and materials of construction. CR-3 utilized examination techniques qualified to meet the requirements of ASME Section XI, Appendix VIII, as required in 10 CFR 50.55a(g)(6)(a)(c), that achieved the maximum practical amount of coverage obtainable within the limitations imposed by the design of the components and examination techniques. Additionally, VT-2 examinations are performed on the subject components of the Reactor Coolant Pressure Boundary during system pressure tests on a refueling outage frequency. Those examinations were completed each refueling outage and no evidence of leakage was identified for these components.

The mandated requirement in 10 CFR 50.55a(b)(2)(xv)(A)(2) states, "Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaw on the opposite side of the weld." The Appendix VIII techniques applied at CR-3 and within the U. S. nuclear industry, (PDI-UT-2), are not qualified for "Detection or length sizing of circumferentially oriented flaw indications when only single side access is available and the flaw is located on the far side of the weld."

Based on the design configuration of the components and available examinations techniques, CR-3 was not able to achieve greater than 90 percent Code coverage of the required examination volume for the components listed above without major modifications to the components.

6. Proposed Alternative and Basis for Use

No alternative examinations were planned for these welds during the Third Ten-Year ISI Interval. The use of radiography as an alternate volumetric examination for the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc. Additionally, inside radius exams of Class 1 nozzles on pressurizers and steam generators are no longer required by the Code.

Based on the above, with due consideration of the earlier plant design, the underlying objectives of the Code required volumetric examinations have been met. The examinations were completed to the extent practical and evidenced no unacceptable flaws present. VT-2 examinations performed on the subject Class 1 components during system pressure testing each refueling outage provide continued assurance that the structural integrity of the subject components is maintained.

Ultrasonic examination of these welds was conducted using personnel qualified in accordance with ASME Section XI, Appendix VII of the 1998 Edition, no Addenda. Ultrasonic procedures complied with the requirements of ASME Section V, Article 4 of the 1989 Edition, as amended by Section XI, Appendix I. IWB-2500, Table IWB-2500-1, Examination Category B-P System Leakage Tests and VT-2 visual examinations performed each refueling outage provide adequate assurance of pressure boundary integrity. In addition to the above Code required examinations (volumetric and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through these welds, it would be detected and proper action taken. Specifically, system leak rate limitations are imposed by Improved Technical Specification 3.4.12, "RCS Operational LEAKAGE," and reactor building normal sump rate monitoring provides additional assurance that any leakage would be detected prior to gross failure of the component. The component welds were inspected by volumetric and surface NDE methods during construction and verified to be free from unacceptable fabrication defects.

Therefore, reasonable assurance of quality and safety is based on the achieved coverage and results of the volumetric and/or surface and the pressure testing VT-2 examinations performed.

7. Duration of Proposed Alternative

Relief is requested for the Third Ten-Year ISI Interval for CR-3, which was effective from August 14, 1998, ending August 13, 2008.

8. Precedents (Optional)

9. References (Optional)

ENCLOSURE 1

ATTACHMENT A

COVERAGE DATA

INSERVICE INSPECTION
RELIEF REQUEST #09-001-II
THIRD TEN-YEAR ISI INTERVAL

EXAMINATION COVERAGE FOR RELIEF NOZZLE: B2.2.1

AGGREGATE COVERAGE OBTAINED: 50% **AGGREGATE COVERAGE OBTAINED FOR INSIDE RADIUS: 42%**

Zone Coverage Obtained

Weld 45% Adjacent Base Me 55% Inside Radius: 42%

UPPER SECTION EVALUATION

Examination Volume Definition:

Weld Diameter: 9.53 in. Nozzle Bore Diameter: 2.5 in.

Area Measurement		Volume Calculation	
Weld	10.48 sq. in.	Weld	156.9 cu. in.
Adjacent Base Meta	27.77 sq. in.	Adjacent Base Meta	415.7 cu. in.
Inside Radius	2.9 sq. in.	Inside Radius	11.2 cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	0.0	180.0	0.0	156.9	0%
2	45	1	4.3	180.0	63.8	156.9	41%
3	45	2	0.0	180.0	0.0	156.9	0%
4	45	3	0.5	180.0	7.6	156.9	5%
5	45	4	0.5	180.0	7.6	156.9	5%
6	60	1	7.2	180.0	107.8	156.9	69%
7	60	2	0.0	180.0	0.0	156.9	0%
8	60	3	4.4	180.0	65.3	156.9	42%
9	60	4	4.4	180.0	65.3	156.9	42%
				Totals:	***317.4***	***1411.9***	***22%***

Adjacent Base Metal

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	7.7	180.0	114.8	415.7	28%
2	45	1&2	14.6	180.0	218.0	415.7	52%
3	45	3	7.7	180.0	114.8	415.7	28%
4	45	4	7.7	180.0	114.8	415.7	28%
5	60	1&2	17.6	180.0	263.0	415.7	63%
6	60	3	16.9	180.0	252.7	415.7	61%
7	60	4	16.9	180.0	252.7	415.7	61%
				Totals:	***1330.8***	***2910.0***	***46%***

Inside Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	0.2	180.0	0.9	11.2	8%
2	45	circ	0.1	180.0	0.4	11.2	3%
3	60	axial	1.5	180.0	5.9	11.2	52%
4	60	circ	1.4	180.0	5.5	11.2	49%
				Totals:	***12.7***	***44.9***	***28%***

LOWER SECTION EVALUATION

Examination Volume Definition:

Weld Diameter: 9.53 in. Nozzle Bore Diameter: 2.5 in.

Area Measurement		Volume Calculation	
Weld	7.93 sq. in.	Weld	118.7 cu. in.
Adjacent Base Meta	21.71 sq. in.	Adjacent Base Metal	325.0 cu. in.
Inside Radius	2.5 sq. in.	Inside Radius	9.7 cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	5.5	180.0	81.7	118.7	69%
2	45	1	7.1	180.0	105.7	118.7	89%
3	45	2	0.0	180.0	0.0	118.7	0%
4	45	3	6.7	180.0	100.1	118.7	84%
5	45	4	6.7	180.0	100.1	118.7	84%
6	60	1	7.3	180.0	109.3	118.7	92%
7	60	2	0.0	180.0	0.0	118.7	0%
8	60	3	7.2	180.0	107.6	118.7	91%
9	60	4	7.2	180.0	107.6	118.7	91%
				Totals:	***712.3***	***1068.4***	***67%***

Adjacent Base Metal

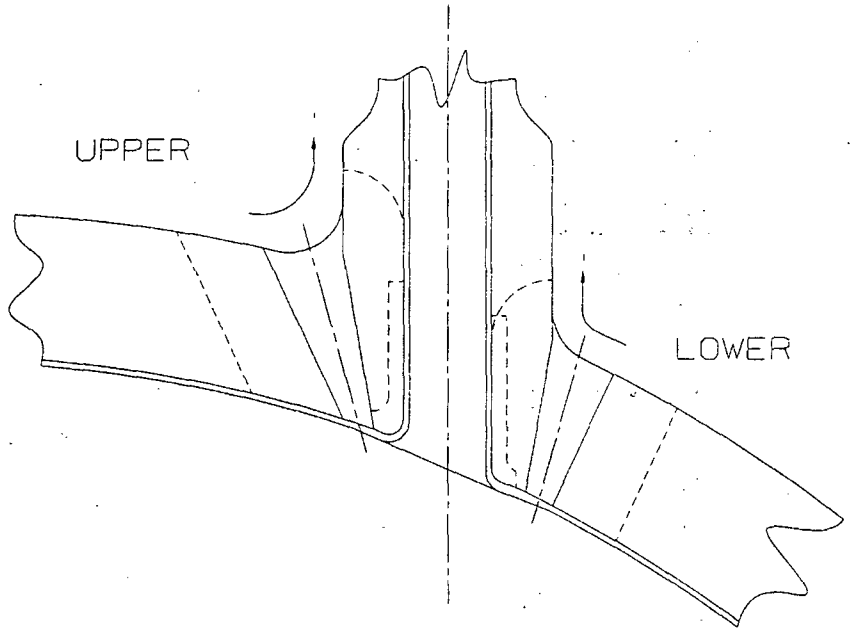
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	11.3	180.0	169.2	325.0	52%
2	45	1&2	16.0	180.0	239.8	325.0	74%
3	45	3	11.3	180.0	169.2	325.0	52%
4	45	4	11.3	180.0	169.2	325.0	52%
5	60	1&2	17.1	180.0	256.6	325.0	79%
6	60	3	15.0	180.0	224.1	325.0	69%
7	60	4	15.0	180.0	224.1	325.0	69%
				Totals:	***1452.1***	***2274.9***	***64%***

Inside Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	1.6	180.0	6.4	9.7	66%
2	45	circ	0.6	180.0	2.2	9.7	23%
3	60	axial	2.1	180.0	8.1	9.7	84%
4	60	circ	1.2	180.0	4.7	9.7	49%
				Totals:	***21.4***	***38.6***	***55%***

PRESSURIZER RELIEF NOZZLE TO UPPER HEAD (WELD WP-33)

B2.2.1



EXAMINATION COVERAGE FOR RELIEF NOZZLE: B2.2.2

AGGREGATE COVERAGE OBTAINED: 50%

AGGREGATE COVERAGE OBTAINED FOR INSIDE RADIUS 42%

Zone Coverage Obtained

Weld 45% | Adjacent Base Metal: 55% | Inside Radius: 42%

UPPER SECTION EVALUATION

Examination Volume Definition

Weld Diameter: 9.53 in. Nozzle Bore Diameter: 2.5 in.

Area Measurement		Volume Calculation	
Weld	10.48 sq. in.	Weld	156.9 cu. in.
Adjacent Base Metal	27.77 sq. in.	Adjacent Base Metal	415.7 cu. in.
Inside Radius	2.9 sq. in.	Inside Radius	11.2 cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	0.0	180.0	0.0	156.9	0%
2	35/45	1	4.3	180.0	63.8	156.9	41%
3	35/45	2	0.0	180.0	0.0	156.9	0%
4	35/45	3	0.5	180.0	7.6	156.9	5%
5	35/45	4	0.5	180.0	7.6	156.9	5%
6	60	1	7.2	180.0	107.8	156.9	69%
7	60	2	0.0	180.0	0.0	156.9	0%
8	60	3	4.4	180.0	65.3	156.9	42%
9	60	4	4.4	180.0	65.3	156.9	42%
				Totals:	***317.4***	***1411.9***	***22%***

Adjacent Base Metal

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	7.7	180.0	114.8	415.7	28%
2	35/45	1&2	14.8	180.0	218.0	415.7	52%
3	35/45	3	7.7	180.0	114.8	415.7	28%
4	35/45	4	7.7	180.0	114.8	415.7	28%
5	60	1&2	17.6	180.0	263.0	415.7	63%
6	60	3	16.9	180.0	252.7	415.7	61%
7	60	4	16.9	180.0	252.7	415.7	61%
				Totals:	***1330.8***	***2910.0***	***46%***

Inside Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	0.2	180.0	0.9	11.2	8%
2	45	circ	0.1	180.0	0.4	11.2	3%
3	60	axial	1.5	180.0	5.9	11.2	52%
4	60	circ	1.4	180.0	5.5	11.2	49%
				Totals:	***12.7***	***44.9***	***28%***

LOWER SECTION EVALUATION

Examination Volume Definition

Weld Diameter: 9.53 in. Nozzle Bore Diameter: 2.5 in.

Area Measurement		Volume Calculation	
Weld	7.93 sq. in.	Weld	118.7 cu. in.
Adjacent Base Metal	21.71 sq. in.	Adjacent Base Metal	325.0 cu. in.
Inside Radius	2.5 sq. in.	Inside Radius	9.7 cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	5.5	180.0	81.7	118.7	69%
2	35/45	1	7.1	180.0	105.7	118.7	89%
3	35/45	2	0.0	180.0	0.0	118.7	0%
4	35/45	3	6.7	180.0	100.1	118.7	84%
5	35/45	4	6.7	180.0	100.1	118.7	84%
6	60	1	7.3	180.0	109.3	118.7	92%
7	60	2	0.0	180.0	0.0	118.7	0%
8	60	3	7.2	180.0	107.6	118.7	91%
9	60	4	7.2	180.0	107.6	118.7	91%
				Totals:	***712.3***	***1068.4***	***67%***

Adjacent Base Metal

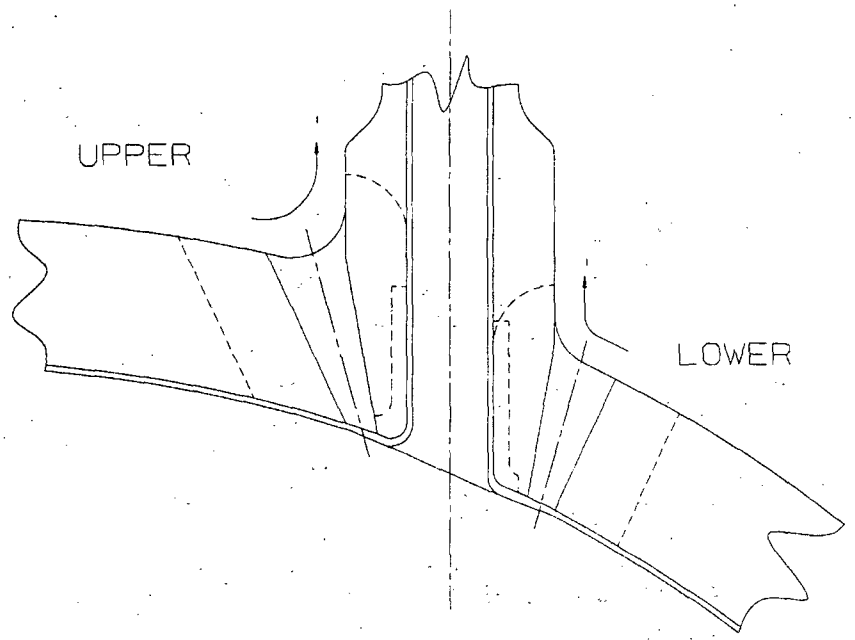
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	11.3	180.0	169.2	325.0	52%
2	35/45	1&2	16.0	180.0	239.8	325.0	74%
3	35/45	3	11.3	180.0	169.2	325.0	52%
4	35/45	4	11.3	180.0	169.2	325.0	52%
5	60	1&2	17.1	180.0	256.6	325.0	79%
6	60	3	15.0	180.0	224.1	325.0	69%
7	60	4	15.0	180.0	224.1	325.0	69%
				Totals:	***1452.1***	***2274.9***	***64%***

Inside Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	1.6	180.0	6.4	9.7	66%
2	45	circ	0.6	180.0	2.2	9.7	23%
3	60	axial	2.1	180.0	8.1	9.7	84%
4	60	circ	1.2	180.0	4.7	9.7	49%
				Totals:	***21.4***	***38.6***	***55%***

PRESSURIZER RELIEF NOZZLE TO UPPER HEAD (WELD WP-33)

B2.2.2



EXAMINATION COVERAGE FOR RELIEF NOZZLE: B2.2.3

AGGREGATE COVERAGE OBTAINED: 50%

AGGREGATE COVERAGE OBTAINED FOR INSIDE RADIUS 42%

Zone Coverage Obtained		
Weld 45%	Adjacent Base Me 55%	Inside Radius: 42%

UPPER SECTION EVALUATION

Examination Volume Definition

Weld Diameter: 9.53 in. Nozzle Bore Diameter: 2.5 in.

Area Measurement		Volume Calculation	
Weld	10.48 sq. in.	Weld	156.9 cu. in.
Adjacent Base Meta	27.77 sq. in.	Adjacent Base Meta	415.7 cu. in.
Inside Radius	2.9 sq. in.	Inside Radius	11.2 cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	0.0	180.0	0.0	156.9	0%
2	35/45	1	4.3	180.0	63.8	156.9	41%
3	35/45	2	0.0	180.0	0.0	156.9	0%
4	35/45	3	0.5	180.0	7.6	156.9	5%
5	35/45	4	0.5	180.0	7.6	156.9	5%
6	60	1	7.2	180.0	107.8	156.9	69%
7	60	2	0.0	180.0	0.0	156.9	0%
8	60	3	4.4	180.0	65.3	156.9	42%
9	60	4	4.4	180.0	65.3	156.9	42%
				Totals:	***317.4***	***1411.9***	***22%***

Adjacent Base Metal

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	7.7	180.0	114.8	415.7	28%
2	35/45	1&2	14.6	180.0	218.0	415.7	52%
3	35/45	3	7.7	180.0	114.8	415.7	28%
4	35/45	4	7.7	180.0	114.8	415.7	28%
5	60	1&2	17.6	180.0	263.0	415.7	63%
6	60	3	16.9	180.0	252.7	415.7	61%
7	60	4	16.9	180.0	252.7	415.7	61%
				Totals:	***1330.8***	***2910.0***	***46%***

Inside Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	0.2	180.0	0.9	11.2	8%
2	45	circ	0.1	180.0	0.4	11.2	3%
3	60	axial	1.5	180.0	5.9	11.2	52%
4	60	circ	1.4	180.0	5.5	11.2	49%
				Totals:	***12.7***	***44.9***	***28%***

LOWER SECTION EVALUATION

Examination Volume Definition

Weld Diameter: 9.53 in. Nozzle Bore Diameter: 2.5 in.

Area Measurement		Volume Calculation	
Weld	7.93 sq. in.	Weld	118.7 cu. in.
Adjacent Base Meta	21.71 sq. in.	Adjacent Base Metal	325.0 cu. in.
Inside Radius	2.5 sq. in.	Inside Radius	9.7 cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	5.5	180.0	81.7	118.7	69%
2	35/45	1	7.1	180.0	105.7	118.7	89%
3	35/45	2	0.0	180.0	0.0	118.7	0%
4	35/45	3	6.7	180.0	100.1	118.7	84%
5	35/45	4	6.7	180.0	100.1	118.7	84%
6	60	1	7.3	180.0	109.3	118.7	92%
7	60	2	0.0	180.0	0.0	118.7	0%
8	60	3	7.2	180.0	107.6	118.7	91%
9	60	4	7.2	180.0	107.6	118.7	91%
				Totals:	***712.3***	***1068.4***	***67%***

Adjacent Base Metal

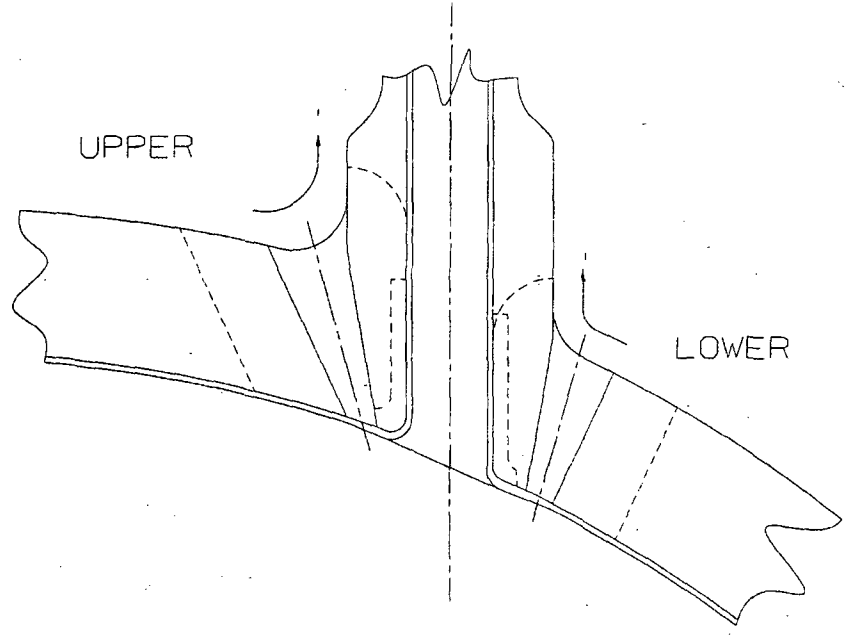
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	11.3	180.0	169.2	325.0	52%
2	35/45	1&2	16.0	180.0	239.8	325.0	74%
3	35/45	3	11.3	180.0	169.2	325.0	52%
4	35/45	4	11.3	180.0	169.2	325.0	52%
5	60	1&2	17.1	180.0	256.6	325.0	79%
6	60	3	15.0	180.0	224.1	325.0	69%
7	60	4	15.0	180.0	224.1	325.0	69%
				Totals:	***1452.1***	***2274.9***	***64%***

Inside Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Degrees Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	1.6	180.0	6.4	9.7	66%
2	45	circ	0.6	180.0	2.2	9.7	23%
3	60	axial	2.1	180.0	8.1	9.7	84%
4	60	circ	1.2	180.0	4.7	9.7	49%
				Totals:	***21.4***	***38.8***	***55%***

PRESSURIZER RELIEF NOZZLE TO UPPER HEAD (WELD WP-33)

B2.2.3



EXAMINATION COVERAGE FOR WELD: B2.2.4

PRESSURIZER SPRAY NOZZLE TO HEAD & INNER RADIUS

AGGREGATE COVERAGE OBTAINED: 56%

Zone Coverage Obtained

Weld: 52% Adjacent Base Metal 58% Inner Radius: 48%

Examination Volume Definition

Weld Length: 27.49 in. BORE 4

Area Measurement			Volume Calculation		
Weld	6.61	sq. in.	Weld	181.7089	cu. in.
Adjacent Base Metal	24.36	sq. in.	Adjacent Base Metal	669.6564	cu. in.
Inner Radius	2.38	sq. in.	Inner Radius	9.52	cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	3.6	27.49	99.8	181.7	55%
2	45	1	6.1	27.49	168.5	181.7	93%
3	45	2	0.0	27.49	0.0	181.7	0%
4	45	3	3.6	27.49	99.8	181.7	55%
5	45	4	3.6	27.49	99.8	181.7	55%
6	60	1	6.4	27.49	174.8	181.7	96%
7	60	2	0.0	27.49	0.0	181.7	0%
8	60	3	3.6	27.49	99.8	181.7	55%
9	60	4	3.6	27.49	99.8	181.7	55%
				Totals:	*842.3*	*1635.4*	*52%*

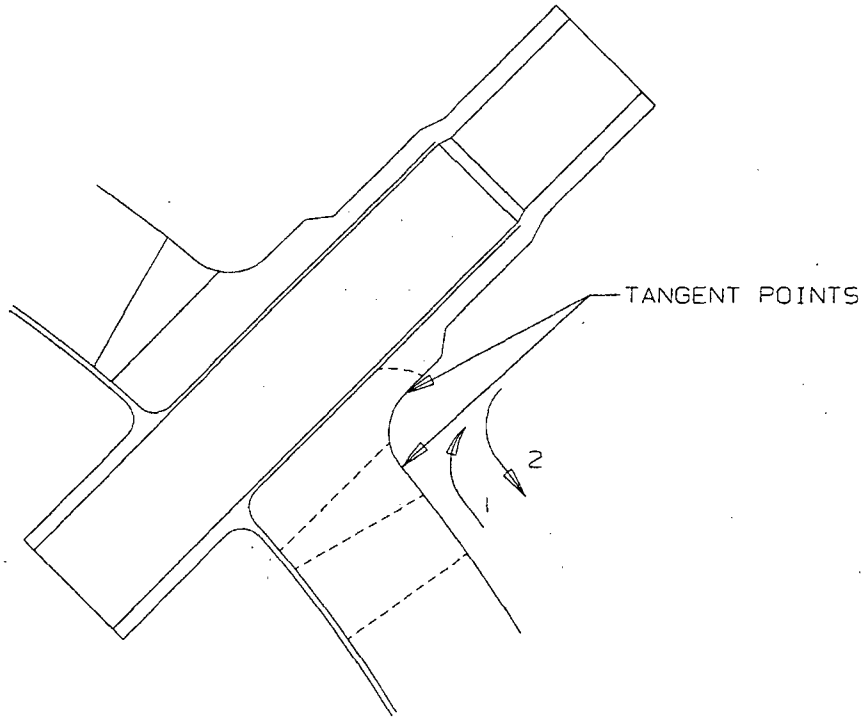
Adjacent Base Metal

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	12.4	27.49	339.8	669.7	51%
2	45	1&2	18.3	27.49	503.1	669.7	75%
3	45	3	12.4	27.49	339.8	669.7	51%
4	45	4	12.4	27.49	339.8	669.7	51%
5	60	1&2	19.7	27.49	541.8	669.7	81%
6	60	3	12.4	27.49	339.8	669.7	51%
7	60	4	12.4	37.7	466.0	918.4	51%
				Totals:	*2870.0*	*4936.3*	*58%*

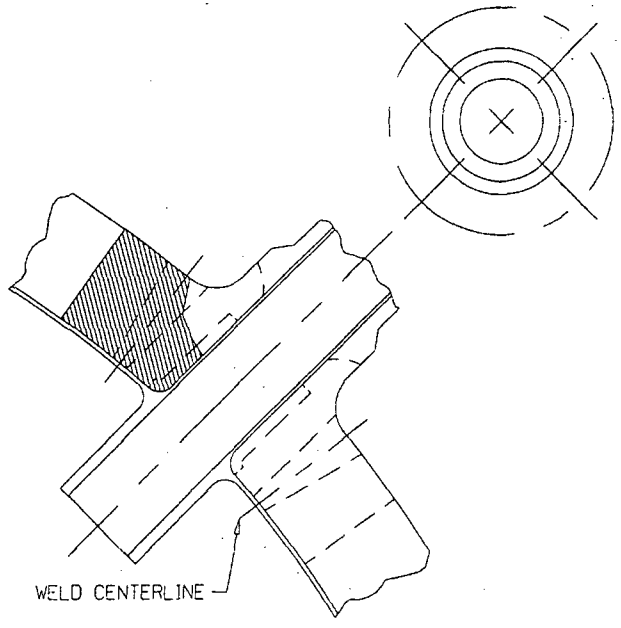
Inner Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	1.0	12.6	12.6	29.9	42%
2	45	circ	0.6	12.6	7.4	29.9	25%
3	60	axial	1.6	12.6	20.6	29.9	69%
4	60	circ	1.3	12.6	16.7	29.9	56%
				Totals:	*57.3*	*119.6*	*48%*

PRESSURIZER SPRAY NOZZLE TO UPPER HEAD WELD (WP34)
B2.2.4



PRESSURIZER SPRAY NOZZLE (WP34)
B2.2.4



Supplemental Report

Nuclear Generation Group

Report No UT-03-137

Summary No B3 2 1

Examiner	Brannin, Michael MB	Level	II	Reviewer	N/A	Date	
Examiner	Dittrich, Victor W	Level	II	Site Review	Hecht, Jeff W / LV III JH	Date	11-13-03
Other	N/A	Level	N/A	ANII Review	C. Colarte CSC	Date	12-8-03

Comments **Examination Coverage for Weld: B3 2.1**

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EXAMINATION COVERAGE FOR WELD B3.2 1

STEAM GENERATOR "A" INLET NOZZLE "WG25" & INNER RADIUS

AGGREGATE COVERAGE OBTAINED 46%

Zone Coverage Obtained

Weld 29% Adjacent Base Metal 51% Inner Radius 61%

Examination Volume Definition

Weld Length 179.54 in (57.54*PI) BORE 45.13

Area Measurement		Volume Calculation	
Weld	18.62 sq. in.	Weld	3343.035 cu. in.
Adjacent Base Metal	84.18 sq. in.	Adjacent Base Metal	15113.68 cu. in.
Inner Radius	4.56 sq. in.	Inner Radius	205.7928 cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	3.4	179.5	610.4	3343.0	18%
2	45	1	15.5	179.5	2782.9	3343.0	83%
3	45	2	0.0	179.5	0.0	3343.0	0%
4	45	3	3.4	179.5	610.4	3343.0	18%
5	45	4	3.4	179.5	610.4	3343.0	18%
6	60	1	16.5	179.5	2962.4	3343.0	89%
7	60	2	0.0	179.5	0.0	3343.0	0%
8	60	3	3.4	179.5	610.4	3343.0	18%
9	60	4	3.4	179.5	610.4	3343.0	18%
				Totals	*8797.5*	*30087.3*	*29%*

Adjacent Base Metal

Entry #	Exam Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	38.2	179.5	6858.4	15113.7	45%
2	45	1&2	51.2	179.5	9192.4	15113.7	61%
3	45	3	38.2	179.5	6858.4	15113.7	45%
4	45	4	38.2	179.5	6858.4	15113.7	45%
5	60	1&2	58.8	179.5	10557.0	15113.7	70%
6	60	3	38.2	179.5	6858.4	15113.7	45%
7	60	4	38.2	179.5	6858.4	15113.7	45%
				Totals	*54041.5*	*105795.7*	*51%*

Inner Radius

Entry #	Exam Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45&60	axial	2.8	141.8	397.0	648.5	61%
2	45&60	tangent	2.8	141.8	397.0	648.5	61%
				Totals	*794.0*	*1293.0*	*61%*

Supplemental Report

Nuclear Generation Group

Report No UT-03-137

Page 3 of 3

Summary No B3 2.1

Examiner	Brannin, Michael MB	Level	II	Reviewer	N/A	Date	
Examiner	Dittrich, Victor W. AWD	Level	II	Site Review	Hecht, Jeff W / LV III JH	Date	11-13-03
Other	N/A	Level	N/A	ANII Review	C Colarte cc	Date	12 8 03

Comments **Steam Generator (A) Inlet Nozzle B3.2 1 / B3.2.1.1**

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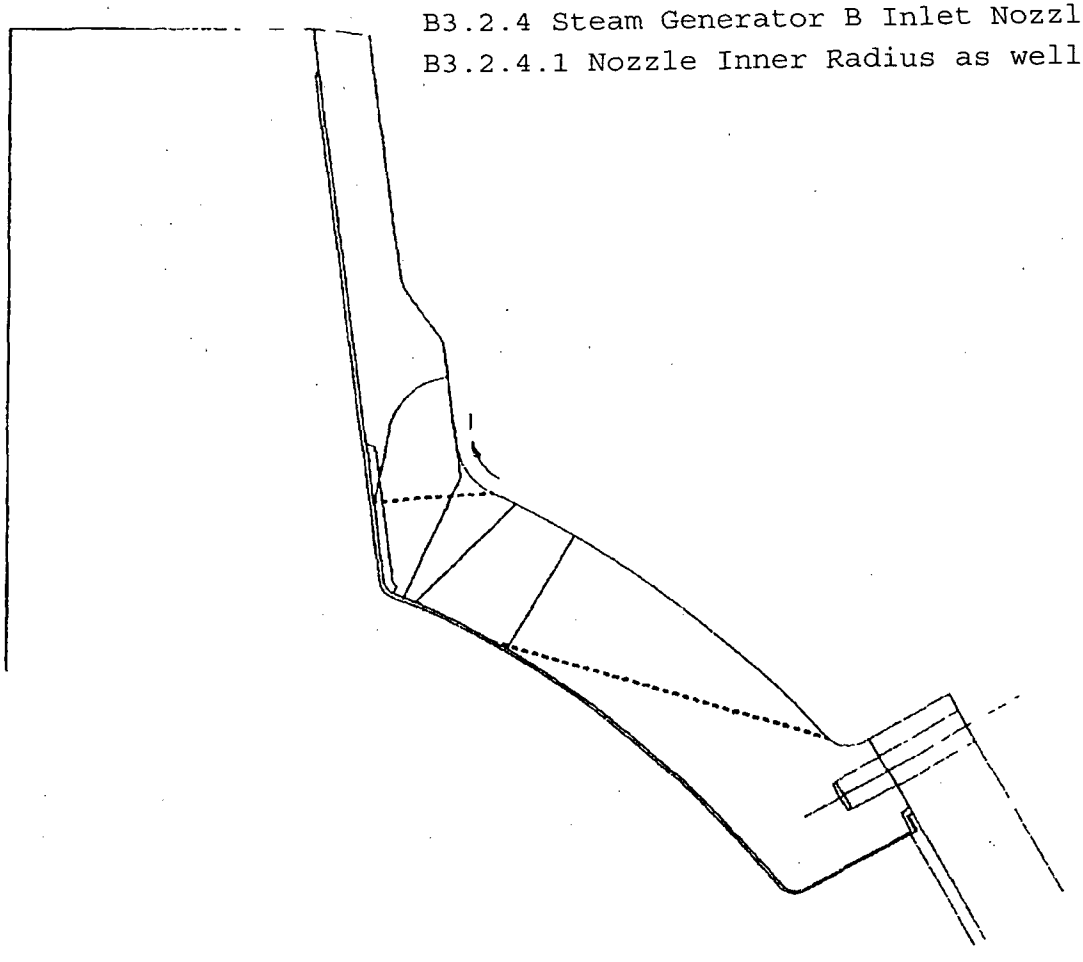
STEAM GENERATOR (A) INLET NOZZLE B3 2 1/B3 2 1 1

This Coverage data is representative of B3.2.4 Steam Generator B Inlet Nozzle and B3.2.4.1 Nozzle Inner Radius as well.



Supplemental Report

Nuclear Generation Group

Report No UT-03-134

12-16-03

Summary No B3.2.1 & 5.0

Examiner	Tomlinson, Robert RT	Level	II	Reviewer	Larson, Scott / Level III	Date	10/22/2003
Examiner	Wilkey, Carl J CW	Level	II	Site Review	Hecht, Jeff W. / LV III	Date	10/22/2003
Other	N/A	Level	N/A	ANII Review	C Colarte	Date	12-6-03

Comments **Examination Coverage for Weld· B3.2.1**

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EXAMINATION COVERAGE FOR WELD. B3 2 1

STEAM GENERATOR "A" INLET NOZZLE "WG25" & INNER RADIUS

AGGREGATE COVERAGE OBTAINED 46%

Zone Coverage Obtained

Weld 29% Adjacent Base Metal 51% Inner Radius 61%

Examination Volume Definition

Weld Length 179 54 in (57 54*PI) BORE 45 13

Area Measurement		Volume Calculation	
Weld	18 62 sq in	Weld	3343 035 cu in
Adjacent Base Metal	84 18 sq in	Adjacent Base Metal	15113 68 cu in
Inner Radius	4 56 sq in	Inner Radius	205 7928 cu in

Examination Coverage Calculations

Weld

Entry #	Exam Angle (deg)	Beam Direction	Area Examined (sq in)	Length Examined (in)	Volume Examined (cu in)	Volume Required (cu in)	Percent Examined
1	0	n/a	3 4	179 5	610 4	3343 0	18%
2	45	1	15 5	179 5	2782 9	3343 0	83%
3	45	2	0 0	179 5	0 0	3343 0	0%
4	45	3	3 4	179 5	610 4	3343 0	18%
5	45	4	3 4	179 5	610 4	3343 0	18%
6	60	1	16 5	179 5	2962 4	3343 0	89%
7	60	2	0 0	179 5	0 0	3343 0	0%
8	60	3	3 4	179 5	610 4	3343 0	18%
9	60	4	3 4	179 5	610 4	3343 0	18%
				Totals	*8797 5*	*30087 3*	*29%*

Adjacent Base Metal

Entry #	Exam Angle (deg)	Beam Direction	Area Examined (sq in)	Length Examined (in)	Volume Examined (cu in)	Volume Required (cu in)	Percent Examined
1	0	n/a	38 2	179 5	6858 4	15113 7	45%
2	45	1&2	51 2	179 5	9192 4	15113 7	61%
3	45	3	38 2	179 5	6858 4	15113 7	45%
4	45	4	38 2	179 5	6858 4	15113 7	45%
5	60	1&2	58 8	179 5	10557 0	15113 7	70%
6	60	3	38 2	179 5	6858 4	15113 7	45%
7	60	4	38 2	179 5	6858 4	15113 7	45%
				Totals	*54041 5*	*105795 7*	*51%*

Inner Radius

Entry #	Exam Angle (deg)	Beam Direction	Area Examined (sq in)	Length Examined (in)	Volume Examined (cu in)	Volume Required (cu in)	Percent Examined
1	45&60	axial	2 8	141 8	397 0	646 5	61%
2	45&60	tangent	2 8	141 8	397 0	646 5	61%
				Totals	*794 0*	*1293 0*	*61%*

Supplemental Report

Nuclear Generation Group

Report No UT-03-134

Page 3 of 3

Summary No B3 2 1 12-16-03 #5 or

Examiner	Tomlinson, Robert RT	Level	II	Reviewer	Larson, Scott / Level III	Date	10/22/2003
Examiner	Wilkey, Carl J. CJW	Level	II	Site Review	Hecht, Jeff W. / LV III	Date	10/22/2003
Other	N/A	Level	N/A	ANII Review	C. Colarte CMC	Date	12-08-03

Comments **Steam Generator (A) Inlet Nozzle B3 2.1 / B3.2.1.1**

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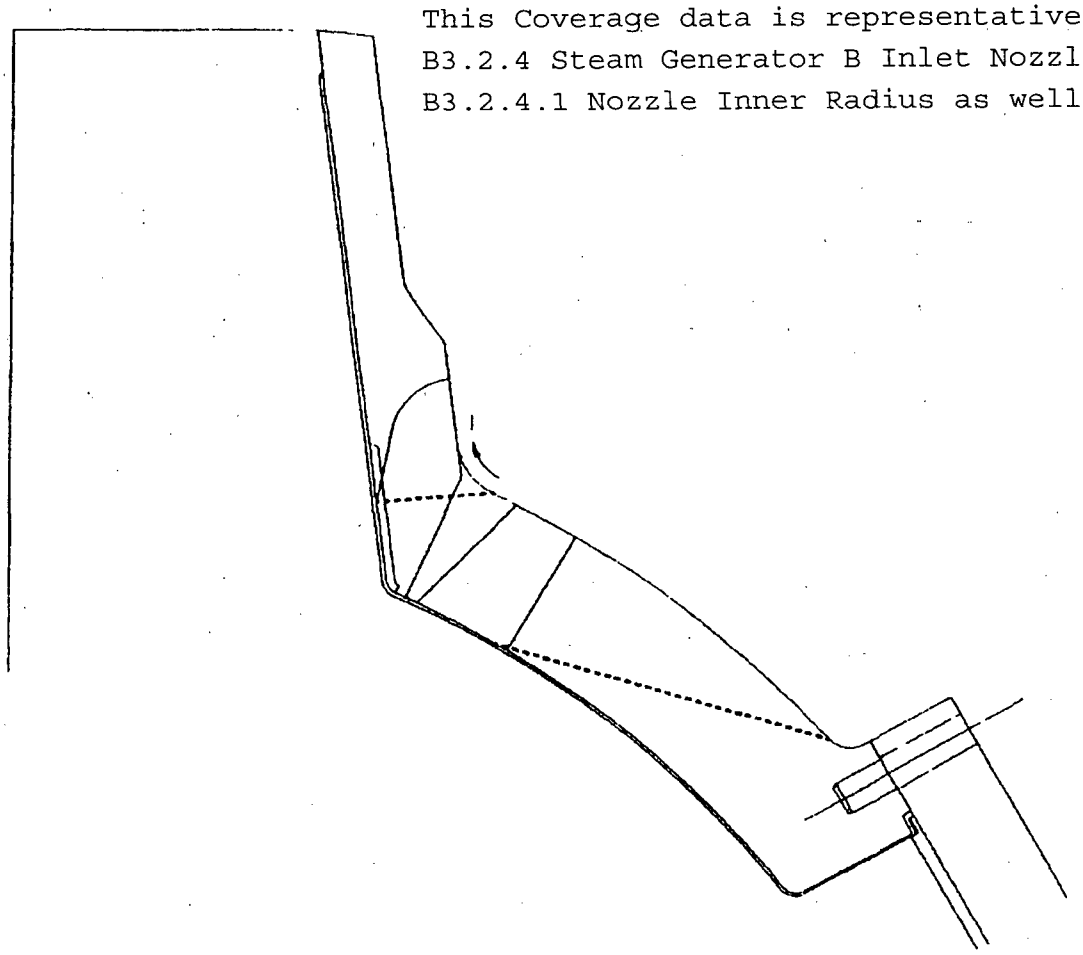
STEAM GENERATOR (A) INLET NOZZLE B3 2 1/B3 2 1 1



This Coverage data is representative of B3.2.4 Steam Generator B Inlet Nozzle and B3.2.4.1 Nozzle Inner Radius as well.

EXAMINATION COVERAGE FOR WELD: B3.2.2/B3.2.2.1

STEAM GENERATOR "A" LOWER HEAD TO NOZZLE "WG50" & INNER RADIUS

AGGREGATE COVERAGE OBTAINED: 63%

Zone Coverage Obtained

Weld: 65% Adjacent Base Metal 63% Inner Radius: 48%

Examination Volume Definition

Weld Length: 118.88 in. (37.84*PI) BORE 90.26

Area Measurement			Volume Calculation		
Weld	20.92	sq. in.	Weld	2486.97	cu. in.
Adjacent Base Metal	108.64	sq. in.	Adjacent Base Metal	12915.12	cu. in.
Inner Radius	4.95	sq. in.	Inner Radius	446.787	cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	18.4	118.88	2192.1	2487.0	88%
2	45	1	17.3	76.88	1330.0	1608.3	83%
3	45	1	10.6	42	445.2	878.6	51%
4	45	2	0.0	118.88	0.0	2487.0	0%
5	45	3	18.4	118.8	2190.7	2485.3	88%
6	45	4	18.4	118.8	2185.9	2485.3	88%
7	60	1	17.3	60.88	1055.7	1273.6	83%
8	60	1	13.0	58	752.3	1213.4	62%
9	60	2	0.0	118.88	0.0	2487.0	0%
10	60	3	18.4	118.88	2187.4	2487.0	88%
11	60	4	18.4	118.88	2187.4	2487.0	88%
				Totals:	*14526.7*	*22379.4*	*65%*

Adjacent Base Metal

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	77.4	100.88	7804.1	10959.6	71%
2	0	n/a	59.2	18	1065.6	1955.5	54%
3	45	1&2	76.4	76.88	5873.6	8352.2	70%
4	45	1&2	54.5	58	3158.1	6301.1	50%
5	45	3	68.6	100.88	6916.3	10959.6	63%
6	45	3	59.2	18	1065.6	1955.5	54%
7	45	4	68.6	100.88	6916.3	10959.6	63%
8	45	4	59.2	18	1065.6	1955.5	54%
9	60	1&2	84.6	60.88	5150.4	6614.0	78%
10	60	1&2	51.5	58	2984.1	6301.1	47%
11	60	3	68.6	100.88	6916.3	10959.6	63%
12	60	3	59.2	18	1065.6	1955.5	54%
13	60	4	68.6	100.88	6916.3	10959.6	63%
14	60	4	59.2	18	1065.6	1955.5	54%
				Totals:	*57963.7*	*92144.1*	*63%*

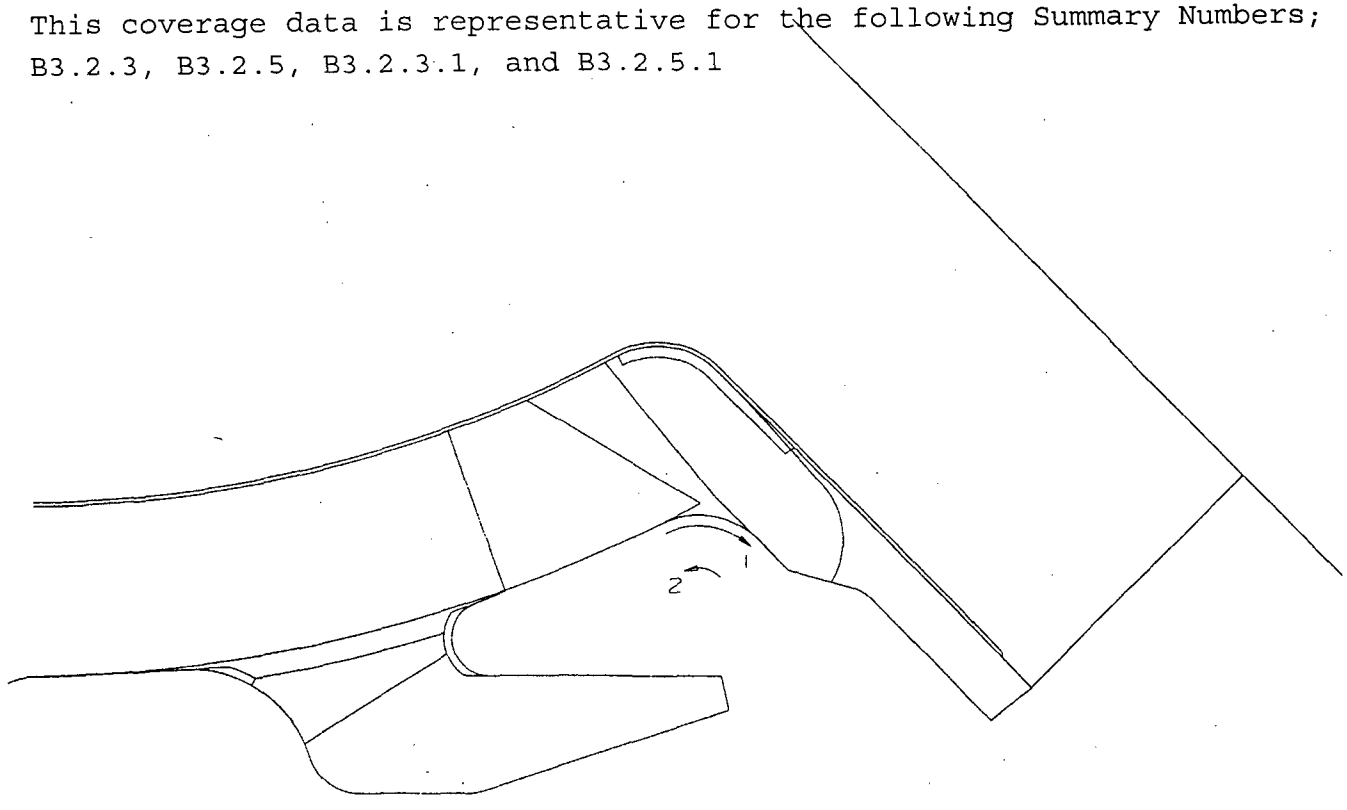
Inner Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	3.4	58.4	198.5	288.9	69%
2	45	axial	0.0	31.9	0.0	157.9	0%
3	60	axial	3.3	46.3	153.1	229.0	67%
4	60	axial	0.0	44.0	0.0	217.8	0%
5	45	tangent	2.8	90.3	252.7	446.8	57%
6	60	tangent	2.8	90.3	252.7	446.8	57%
				Totals:	*857.0*	*1787.1*	*48%*

STEAM GENERATOR PRIMARY OUTLET NOZZLE (WG50)

B3.2.2 / B3.2.2.1

This coverage data is representative for the following Summary Numbers; B3.2.3, B3.2.5, B3.2.3.1, and B3.2.5.1



EXAMINATION COVERAGE FOR WELD: B3.2.3/B3.2.3.1

STEAM GENERATOR "A" OUTLET NOZZLE "WG50" & INNER RADIUS

AGGREGATE COVERAGE OBTAINED: 50%

Zone Coverage Obtained

Weld: 51% Adjacent Base Metal: 49% Inner Radius: 43%

Examination Volume Definition

Weld Length: 118.88 in. (37.84*PI) BORE 90.28

Area Measurement			Volume Calculation		
Weld	20.92	sq. in.	Weld	2486.97	cu. in.
Adjacent Base Metal	108.64	sq. in.	Adjacent Base Metal	12915.12	cu. in.
Inner Radius	4.95	sq. in.	Inner Radius	446.886	cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (In.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	18.4	93.88	1731.1	1964.0	88%
2	0	n/a	0.0	25	0.0	523.0	0%
3	35	1	17.3	73.88	1281.1	1545.6	83%
4	35	1	13.0	20	259.4	418.4	62%
5	35	1	0.0	25	0.0	523.0	0%
6	35	2	0.0	118.88	0.0	2487.0	0%
7	45	3	18.4	88.88	1638.9	1859.4	88%
8	45	3	0.0	30	0.0	627.6	0%
9	45	4	18.4	88.88	1638.9	1859.4	88%
10	45	4	0.0	30	0.0	627.6	0%
11	45&60	1	17.3	73.88	1281.1	1545.6	83%
12	45&60	1	13.0	20	259.4	418.4	62%
13	45&60	1	0.0	25	0.0	523.0	0%
14	45&60	2	0.0	118.88	0.0	2487.0	0%
15	60	3	18.4	88.88	1638.9	1859.4	88%
16	60	3	0.0	30	0.0	627.6	0%
17	60	4	18.4	88.88	1638.9	1859.4	88%
18	60	4	0.0	30	0.0	627.6	0%
				Totals:	*11367.9*	*22382.7*	*51%*

Adjacent Base Metal

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	77.4	88.88	6875.8	9655.9	71%
2	0	n/a	0.0	30	0.0	3259.2	0%
3	35	1&2	76.4	73.88	5643.0	8026.3	70%
4	35	1&2	38.2	20	763.8	2172.8	35%
5	35	1&2	0.0	25	0.0	2716.0	0%
6	45	3	68.6	88.88	6093.6	9655.9	63%
7	45	3	0.0	30	0.0	3259.2	0%
8	45	4	68.6	88.88	6093.6	9655.9	63%
9	45	4	0.0	30	0.0	3259.2	0%
10	45&60	1&2	84.6	73.88	6252.5	8026.3	78%
11	45&60	1&2	39.7	20	793.6	2172.8	37%
12	45&60	1&2	0.0	25	0.0	2716.0	0%
13	60	3	68.6	88.88	6093.6	9655.9	63%
14	60	3	0.0	30	0.0	3259.2	0%
15	60	4	68.6	88.88	6093.6	9655.9	63%
16	60	4	0.0	30	0.0	3259.2	0%
				Totals:	*44703.0*	*90405.9*	*49%*

Inner Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	3.4	56.0	188.6	277.0	68%
2	45	axial	0.0	34.3	0.0	169.8	0%
3	60	axial	3.3	56.0	185.2	277.0	67%
4	60	axial	0.0	34.3	0.0	169.8	0%
5	45	tangent	2.8	71.3	199.7	353.0	57%
6	45	tangent	0.0	19.0	0.0	94.1	0%
7	60	tangent	2.8	71.3	199.7	353.0	57%
8	60	tangent	0.0	19.0	0.0	94.1	0%
				Totals:	*773.1*	*1787.6*	*43%*

EXAMINATION COVERAGE FOR WELD: B3.2.6/B3.2.6.1

STEAM GENERATOR "B" OUTLET NOZZLE "WG50" & INNER RADIUS

AGGREGATE COVERAGE OBTAINED: 49%

Zone Coverage Obtained

Weld: 49% Adjacent Base Metal: 49% Inner Radius: 43%

Examination Volume Definition

Weld Length: 118.88 in. (37.84*PI) BORE 90.26

Area Measurement			Volume Calculation		
Weld	20.92	sq. in.	Weld	2486.97	cu. in.
Adjacent Base Metal	108.64	sq. in.	Adjacent Base Metal	12915.12	cu. in.
Inner Radius	4.95	sq. in.	Inner Radius	446.787	cu. in.

Examination Coverage Calculations

Weld

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	18.4	93.88	1731.1	1964.0	88%
2	0	n/a	0.0	25	0.0	523.0	0%
3	35	1	17.3	73.88	1281.1	1545.6	83%
4	35	1	13.0	20	259.4	418.4	62%
5	35	1	0.0	25	0.0	523.0	0%
6	35	2	0.0	118.88	0.0	2487.0	0%
7	45	3	18.4	83.88	1546.7	1754.8	88%
8	45	3	0.0	35	0.0	732.2	0%
9	45	4	18.4	83.88	1546.7	1754.8	88%
10	45	4	0.0	35	0.0	732.2	0%
11	45&60	1	17.3	73.88	1281.1	1545.6	83%
12	45&60	1	13.0	20	259.4	418.4	62%
13	45&60	1	0.0	25	0.0	523.0	0%
14	45&60	2	0.0	118.88	0.0	2487.0	0%
15	60	3	18.4	83.88	1546.7	1754.8	88%
16	60	3	0.0	35	0.0	732.2	0%
17	60	4	18.4	83.88	1546.7	1754.8	88%
18	60	4	0.0	35	0.0	732.2	0%
				Totals:	*10999.1*	*22382.7*	*49%*

Adjacent Base Metal

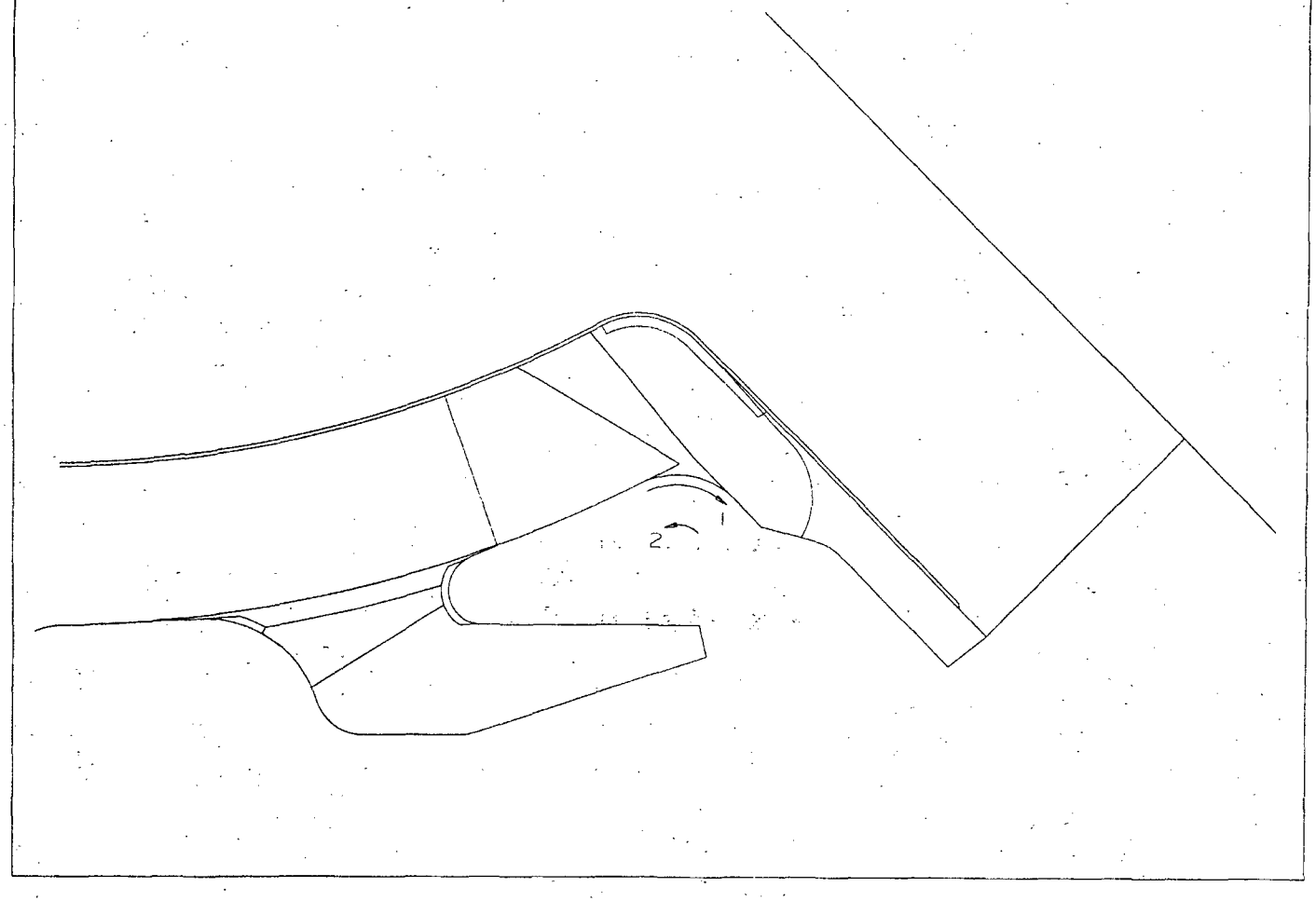
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	0	n/a	77.4	88.88	6875.8	9655.9	71%
2	0	n/a	0.0	30	0.0	3259.2	0%
3	35	1&2	76.4	73.88	5643.0	8026.3	70%
4	35	1&2	38.2	20	763.8	2172.8	35%
5	35	1&2	0.0	25	0.0	2716.0	0%
6	45	3	68.6	88.88	6093.6	9655.9	63%
7	45	3	0.0	30	0.0	3259.2	0%
8	45	4	68.6	88.88	6093.6	9655.9	63%
9	45	4	0.0	30	0.0	3259.2	0%
10	45&60	1&2	84.6	73.88	6252.5	8026.3	78%
11	45&60	1&2	39.7	20	793.6	2172.8	37%
12	45&60	1&2	0.0	25	0.0	2716.0	0%
13	60	3	68.6	88.88	6093.6	9655.9	63%
14	60	3	0.0	30	0.0	3259.2	0%
15	60	4	68.6	88.88	6093.6	9655.9	63%
16	60	4	0.0	30	0.0	3259.2	0%
				Totals:	*44703.0*	*90405.9*	*49%*

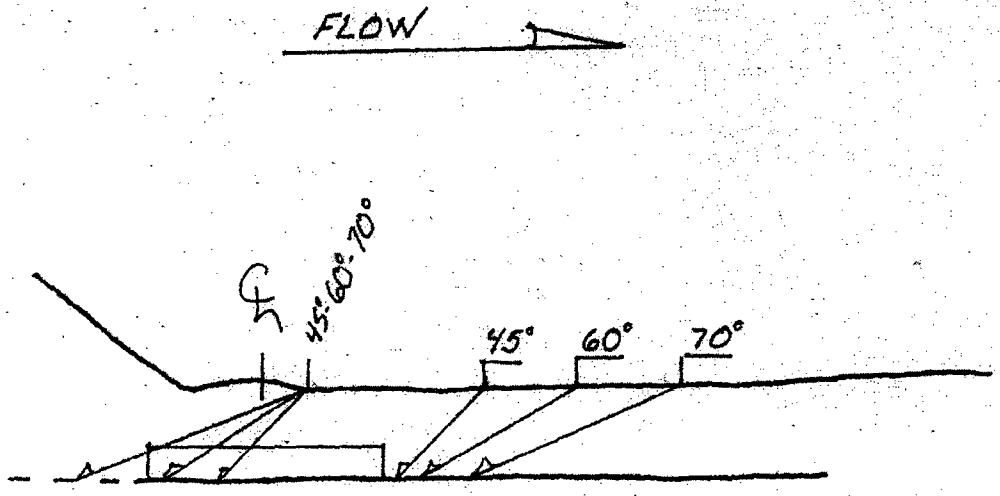
Inner Radius

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined
1	45	axial	3.4	56.0	188.6	277.0	68%
2	45	axial	0.0	34.3	0.0	169.8	0%
3	60	axial	3.3	56.0	185.2	277.0	67%
4	60	axial	0.0	34.3	0.0	169.8	0%
5	45	tangent	2.8	71.3	199.7	353.0	57%
6	45	tangent	0.0	19.0	0.0	93.9	0%
7	60	tangent	2.8	71.3	199.7	353.0	57%
8	60	tangent	0.0	19.0	0.0	93.9	0%
				Totals:	*773.1*	*1787.2*	*43%*

STEAM GENERATOR PRIMARY OUTLET NOZZLE (WG50)

B3.2.6 / B3.2.6.1

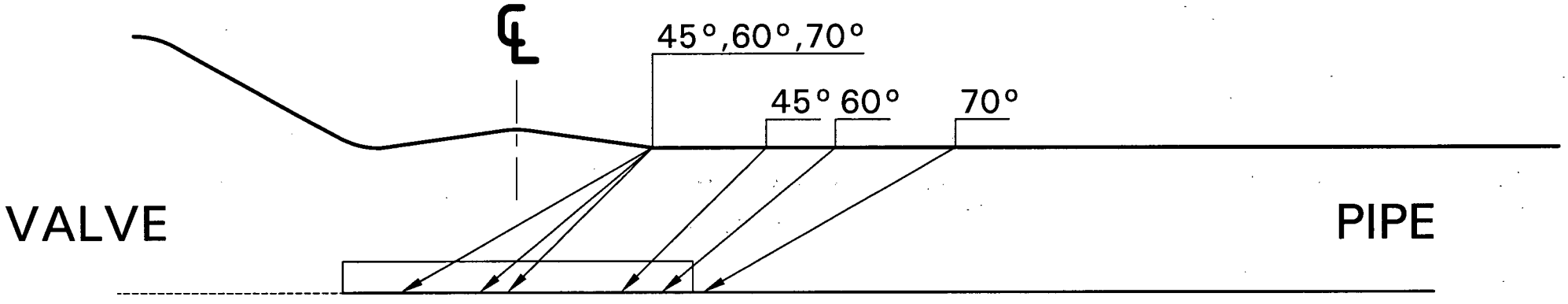




B4.5.165

COVERAGE PLOT

This drawing is representative for the following Summary Numbers; B4.5.71.3, B4.5.79.4, B4.5.84.2 and B4.5.108.17.



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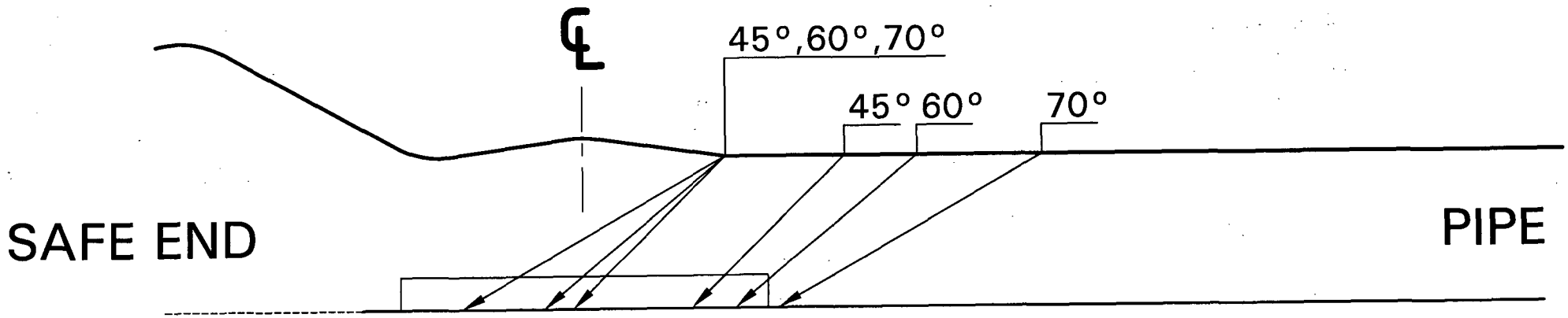
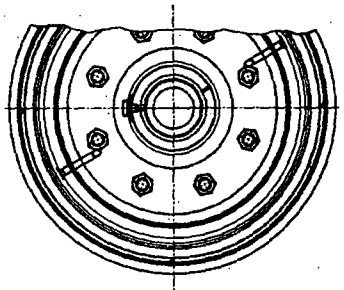
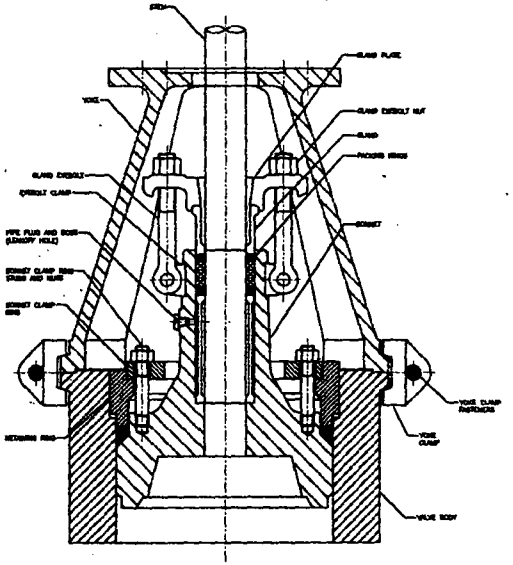
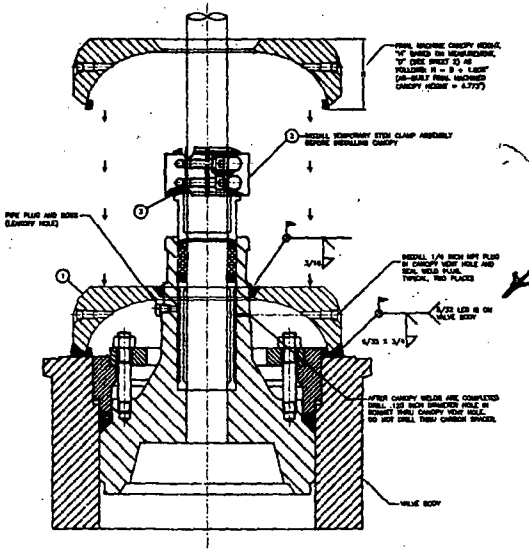


This drawing is for summary number
B6.6.7 Valve Body to Canopy

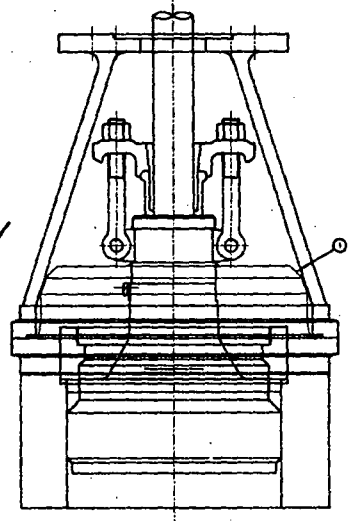




STEP 1



STEP 2



STEP 3

1	—		
1	—		
1	—		
	—		

MPR

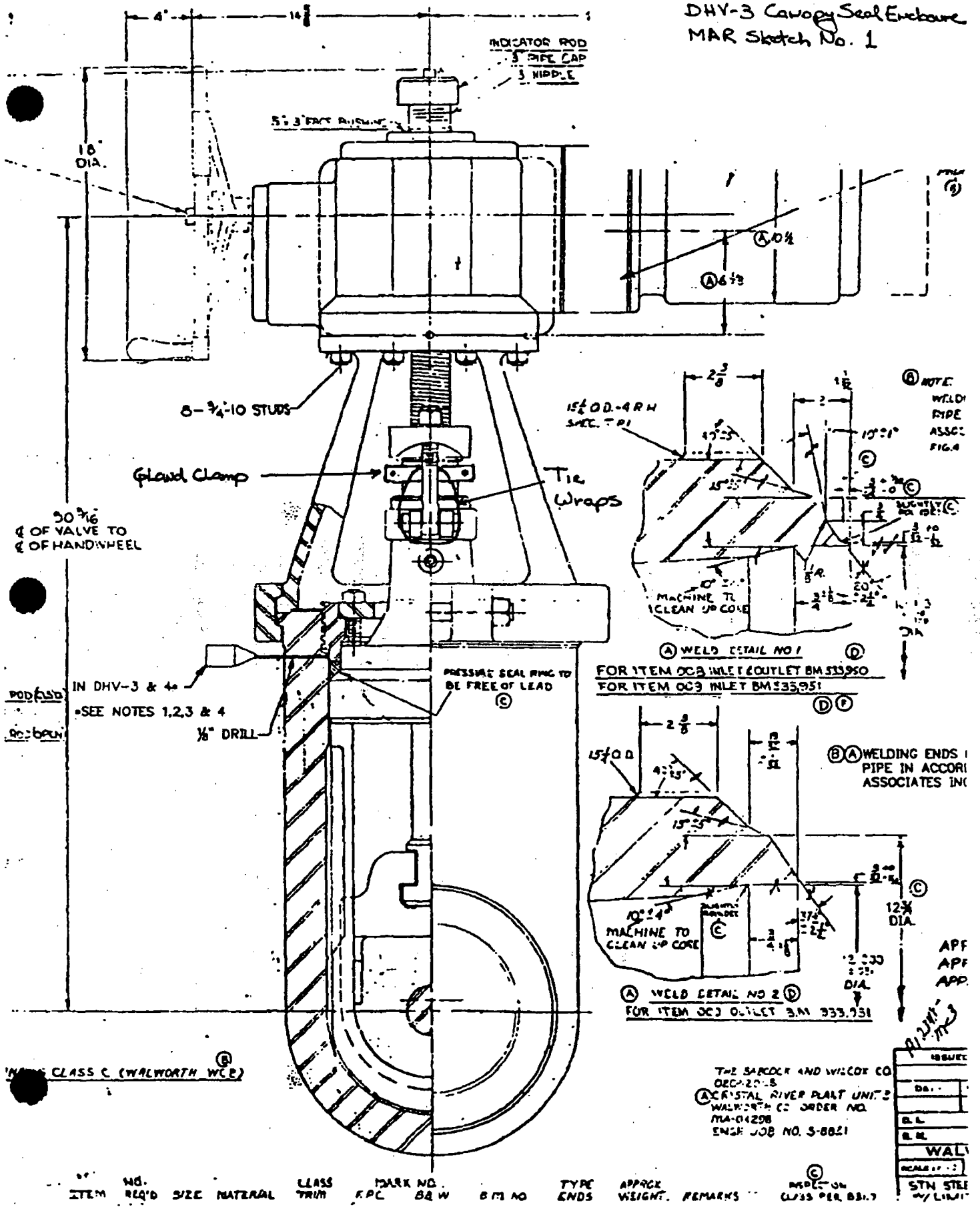
FLORIDA POWER CORPORATION

BWI-3 VALVE MODIFICATION ASSY

CANOPY SEAL ENCLOSURE W/GASKET

1102-109-05

MAR No. 00-08-03-01
DHV-3 Canopy Seal Enclosure
MAR Sketch No. 1



THE BABCOCK AND WILCOX CO.
DEC-20-5
CRYSTAL RIVER PLANT UNIT 3
WALWORTH CO ORDER NO.
MA-04298
ENGR JOB NO. 5-8821

ITEM	NO. REQ'D	SIZE	MATERIAL	CLASS TRIM	MARK NO. F.P.C.	B&W	B.M. NO	TYPE ENDS	APPROX WEIGHT	REMARKS

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ENCLOSURE 2

INSERVICE INSPECTION
RELIEF REQUEST #09-002-II
THIRD TEN-YEAR ISI INTERVAL

10 CFR 50.55a Request #09-002-II

Relief Request
in Accordance with 10 CFR 50.55a(g)(5)(iii)

--Inservice Inspection Impracticality--

1. ASME Code Component(s) Affected

ASME Code Class 2 Piping and Nozzles

Categories: C-A, C-B, C-F-1 and C-F-2

Items: C1.10, C2.21, C5.11, C5.21, C5.51 and Augmented 7.1

2. Applicable Code Edition and Addenda

American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, Section XI, 1989 Edition, no Addenda.

3. Applicable Code Requirement

ASME Code, Section XI, Sub-article IWC-2500 states, in part, "Components shall be examined and tested as specified in Table IWC-2500-1." Table IWC-2500-1 requires an examination of applicable Class 2 pressure retaining-welds, which includes 100 percent of weld length once during the ten-year ISI interval for the following Code Categories:

Category C-A: Item C1.10

Category C-B: Item C2.21

Category C-F-1: Items C5.11, C5.21 and Augmented 7.1

Category C-F-2: Item C5.51

Code Case N-460 permits a reduction in examination coverage of Class 1 and Class 2 welds provided the coverage reduction is less than 10 percent. CR-3 has adopted Code Case N-460 in the Inservice Inspection (ISI) Program Plan, as permitted by NRC Regulatory Guide 1.147, Revision 15.

4. Impracticality of Compliance

At the time CR-3 was constructed, the ASME Boiler and Pressure Vessel Code only addressed nuclear vessels and associated piping up to and including the first isolation valve. The piping codes of record were USAS B31.7, 1968 Edition for nuclear piping, and USAS B31.1.0-1967 Edition for non-nuclear piping.

10 CFR 50.55a recognizes the limitations to in-service inspection of components in accordance with Section XI of the ASME Code that are imposed due to early plants

design and construction. 10 CFR 50.55a(g)(1) states, "For a boiling or pressurized water-cooled nuclear power facility whose construction permit was issued prior to January 1, 1971, components (including supports) must meet the requirements of paragraphs (g)(4) and (g)(5) of this section, to the extent practical." 10 CFR 50.55a(g)(1) is applicable since the CR-3 construction permit was dated September 25, 1968.

10 CFR 50.55a(g)(4) states, "Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) which are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements, except design and access provisions and pre-service examination requirements, set forth in Section XI of editions of the ASME Boiler and Pressure Vessel Code ... to the extent practical within the limitations of design, geometry and materials of construction of the components."

10 CFR 50.55a(g)(5)(iii) states, "If the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in § 50.4, information to support the determinations."

CR-3 has determined that the following welds were limited from achieving greater than 90 percent of the required examination volume for in-service examinations due to component configuration or physical barriers which would require a major modification to the existing hardware. Therefore, relief is being sought from coverage requirements set forth in ASME Code, Section XI, Sub-article IWC-2500 in accordance with 10 CFR 50.55a(g)(5)(iii).

Relief is requested from performing volumetric examinations of the welds listed in Table A to the extent required by the Code. These examinations are limited by part geometry or interferences with other components such that the reduction in coverage is greater than 10 percent.

Table A

*S/S = stainless steel **C/S = carbon steel

Category	Item	Summary Number	Diameter	Thickness	Material	Coverage Percentage	Description
C-A	C1.10	C1.1.5	N/A	1.50"	S/S*	42.5	Shell to flange
C-B	C2.21	C1.2.3	N/A	1.50"	S/S	45.5	Nozzle to Shell Weld
C-F-1	Augment 7.1	C2.1.190	18"	.375"	S/S	50	Reducer to Flange
		C2.1.192A	10"	.365"	S/S	50	Pipe to Valve
		C2.1.605	10"	.365"	S/S	50	Valve to Elbow
		C2.1.625	8.0"	.322"	S/S	50	Elbow to Valve
		X121.020	10"	.365"	S/S	50	Pipe to Valve
	C5.11	C2.1.104	10"	1.0"	S/S	50	Valve to Pipe
		C2.1.1477	14"	.375"	S/S	50	Elbow to Valve
		C2.1.163	14"	.375"	S/S	50	Valve to Elbow
		C2.1.167	14"	.375"	S/S	50	Elbow to Valve
		C2.1.170	14"	.375"	S/S	50	Pipe to Valve
		C2.1.184	12"	.375"	S/S	50	Valve to Elbow

Category	Item	Summary Number	Diameter	Thickness	Material	Coverage Percentage	Description
		C2.1.503	14"	.375"	S/S	50	Elbow to Valve
		C2.1.507	14"	.375"	S/S	50	Flange to Reducer
		C2.1.526	10"	.365"	S/S	50	Flange to Pipe
		C2.1. 527	10"	.365"	S/S	50	Pipe to Flange
		C2.1.542	14"	.375"	S/S	50	Reducer to valve
		C2.1.543	14"	.375"	S/S	50	Tee to Pipe
		C2.1.548	14"	.375"	S/S	50	Elbow to Valve
		C2.1.600	18"	.375"	S/S	50	Flange to Reducer
	C5.21	C2.1.1018	3.0"	.438"	S/S	50	Pipe to Valve
		C2.1.1031	4"	.531"	S/S	50	Tee to Tee
		C2.1.1040	2.5"	.375"	S/S	50	Pipe to Valve
		C2.1.1047	4.0"	.531"	S/S	50	Valve to Pipe
		C2.1.1060	2.5"	.375"	S/S	87.5	Tee to Elbow
		C2.1.1067	3.0"	.438"	S/S	50	Pipe to Valve
		C2.1.1070	3.0"	.438"	S/S	86.5	Elbow to Pipe
		C2.1.1084	3.0"	.438"	S/S	50	Valve to Reducer
		C2.1.1096	4.0"	.531"	S/S	50	Pipe to Valve
		C2.1.1097	4.0"	.531"	S/S	50	Valve to Pipe
		C2.1.1098	4.0"	.531"	S/S	50	Pipe to Tee
		C2.1.1207	2.5"	.375"	S/S	50	Valve to Pipe
		C2.1.1223	2.5"	.375"	S/S	50	Valve to Pipe
		C2.1.1272	2.5"	.375"	S/S	50	Tee to Pipe
		C2.1.2073	2.5"	.375"	S/S	50	Elbow to Flange
		C2.1.2078	4.0"	.237"	S/S	50	Elbow to Flange
		C2.1.2117	3.0"	.438"	S/S	80	Elbow to Pipe
		C2.1.2136	3.0"	.438"	S/S	50	Pipe to Valve
		C2.1.2137	3.0"	.438"	S/S	50	Valve to Pipe
		C2.1.2162	3.0"	.438"	S/S	50	Pipe to Valve
		C2.1.2164	3.0"	.438"	S/S	50	Tee to Valve
		C2.1.2169	3.0"	.438"	S/S	50	Valve to Pipe
		C2.1.2173	3.0"	.438"	S/S	50	Pipe to Valve
		C2.1.2174	3.0"	.438"	S/S	50	Tee to Pipe
		C2.1.2175	3.0"	.438"	S/S	50	Pipe to Valve
		C2.1.2176	3.0"	.438"	S/S	50	Valve to Pipe
		C2.1.2199	3.0"	.438"	S/S	50	Tee to Pipe
		C2.1.2200	3.0"	.438"	S/S	50	Pipe to Tee
		C2.1.2202	3.0"	.438"	S/S	50	Pipe to Valve
		C2.1.2238	4.0"	.531"	S/S	50	Pipe to valve
		C2.1.2240	4.0"	.531"	S/S	50	Valve to Pipe
C-F-2	C5.51	C2.1.118	6.0"	.8"	C/S**	74	Sweepolet to Flange
		C2.1.121	24.0"	.969"	C/S	50	Pipe to Valve
		C2.1.122	6.0"	.8"	C/S	79.86	Sweepolet to Flange
		C2.1.132	10.0"	.5"	C/S	50	Valve to Pipe
		C2.1.290	6.0"	.8"	C/S	74	Sweepolet to Flange
		C2.1.8	24.0"	.969"	C/S	75	Pipe to Valve

Examination Details

C1.10 Shell to Flange Weld: Summary Number C1.1.5

Ultrasonic examination of the subject weld was limited in coverage due to component configuration and/or immovable physical barriers. It is not possible to perform a 100 percent ultrasonic examination from both sides of the weld since one side of the weld was not suitable for scanning based on the scanning surface angle of the component (Flange). Therefore, the weld only received a single sided examination or partial single sided examination resulting in less than 90 percent coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

C2.21 Nozzle to Shell Weld: Summary Number C1.2.3

Ultrasonic examination of the subject weld was limited in coverage due to component configuration and/or immovable physical barriers. It is not possible to perform a 100 percent ultrasonic examination from both sides of the weld since scanning was performed on the shell side only. The scanning surface of the pipe is perpendicular to the shell surface which prohibits the ultrasonic wave entering the Code required examination volume at an angle that will integrate the weld volume for in-service flaws. Therefore, the weld only received a single sided examination or partial single sided examination resulting in less than 90 percent coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

C5.11, C5.21, C5.51 and Augmented 7.1 Circumferential Pipe Welds: Summary Numbers C-F-1 and C-F-2

Ultrasonic examination of the above pipe welds was limited in coverage due to component configuration and/or immovable physical barriers. It is not possible to perform a 100 percent ultrasonic examination from both sides of the weld since one side of the weld was not suitable for scanning based on the scanning surface angle of the component. Therefore, the welds only received a single sided examination or partial single sided examination resulting in less than 90 percent coverage of the required examination volume. The percentage of coverage reported represents the aggregate coverage from all examination angles and scans performed on the weld and adjacent base material. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. (See Attachment A for the cross-sectional view of the weld and limitations.)

5. Burden Caused by Compliance

In order to scan all of the required volume for these welds, the components would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications (other than geometric indications) found during the inspection of these welds. Based on the components designed configuration, the available coverage will not meet the requirements of the ASME Code, Code Case N-578 or Code Case N-460.

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested for the components listed in Table A on the basis that the required examination coverage of "essentially 100 percent" is impractical due to physical obstructions and the limitations imposed by design, geometry, and materials of construction. CR-3 utilized examination techniques qualified to meet the requirements of ASME Section XI, Appendix VIII, as required in 10 CFR 50.55a(g)(6)(a)(c), that achieved the maximum practical amount of coverage obtainable within the limitations imposed by the design of the components and examination techniques. Additionally, VT-2 examinations are performed on the subject components of the Reactor Coolant Pressure Boundary during system pressure tests on a periodic frequency. Those examinations were completed and no evidence of leakage was identified for these components.

The mandated requirement in 10 CFR 50.55a(b)(2)(xv)(A)(2) states, "Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaw on the opposite side of the weld." The Appendix VIII techniques applied at CR-3, (PDI-UT-2), are not qualified for "Detection or length sizing of circumferentially oriented flaw indications when only single side access is available and the flaw is located on the far side of the weld."

Based on the design configuration of the components and available examinations techniques, CR-3 was not able to achieve greater that 90 percent Code coverage of the required examination volume for the components listed above without major modifications to the components.

6. Proposed Alternative and Basis for Use

No alternative examinations were performed for these welds during the Third Ten-Year ISI Interval. The use of radiography as an alternate volumetric examination for all the above listed components is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

With due consideration of the earlier plant design, the underlying objectives of the Code required volumetric examinations have been met. The examinations were completed to the extent practical and evidenced no unacceptable flaws present. VT-2 examinations performed on the subject Class 2 components during periodic system pressure testing provide continued assurance that the structural integrity of the subject components is maintained.

Ultrasonic examination of the welds was conducted using personnel qualified in accordance with ASME Section XI, Appendix VII of the 1998 Edition, no Addenda.

Ultrasonic procedures complied with the requirements of ASME Section V, Article 4 of the 1989 Edition as amended by Section XI, Appendix I. IWC-2500, Table IWC-2500-1, Examination Category C-H System Leakage Tests and VT-2 visual examinations performed on a periodic basis provide adequate assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through these welds, it would be detected and proper action taken. Specifically, system leak rate limitations imposed by Improved Technical Specification 3.4.12, "RCS Operational LEAKAGE," and reactor building normal sump rate monitoring, provide additional assurance that any leakage would be detected prior to gross failure of the component. The component weld was inspected by volumetric and surface NDE methods during construction and verified to be free from unacceptable fabrication defects.

Therefore, reasonable assurance of quality and safety is based on the achieved coverage and results of the volumetric and/or surface and the pressure testing VT-2 examinations performed.

7. Duration of Proposed Alternative

Relief is requested for the Third Ten-Year ISI Interval for CR-3, which was effective from August 14, 1998, ending August 13, 2008.

8. Precedents (Optional)

9. References (Optional)

ENCLOSURE 2

ATTACHMENT A

COVERAGE DATA

INSERVICE INSPECTION
RELIEF REQUEST #09-002-II
THIRD TEN-YEAR ISI INTERVAL

Supplemental Report

Report No.: UT-07-001

Page: 4 of 4

Summary No.: C1.1.5

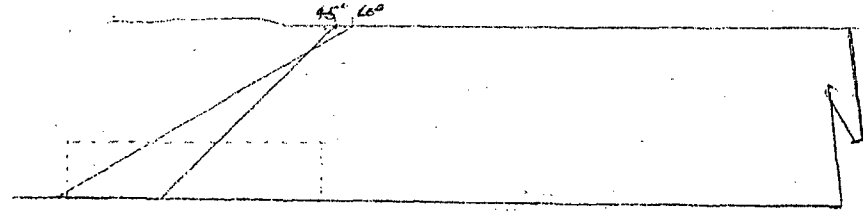
Examiner: Downs, William R. — Level: III-PDI — Reviewer: ~~Kelly, Bradley~~ DAMON PRIESTLEY — Date: 11-12-07

Examiner: N/A — Level: N/A — Site Review: HAW DLEW — Date: 11-18-07

Other: N/A — Level: N/A — ANII Review: Wyatt, Thomas W. — Date: 11/19/07

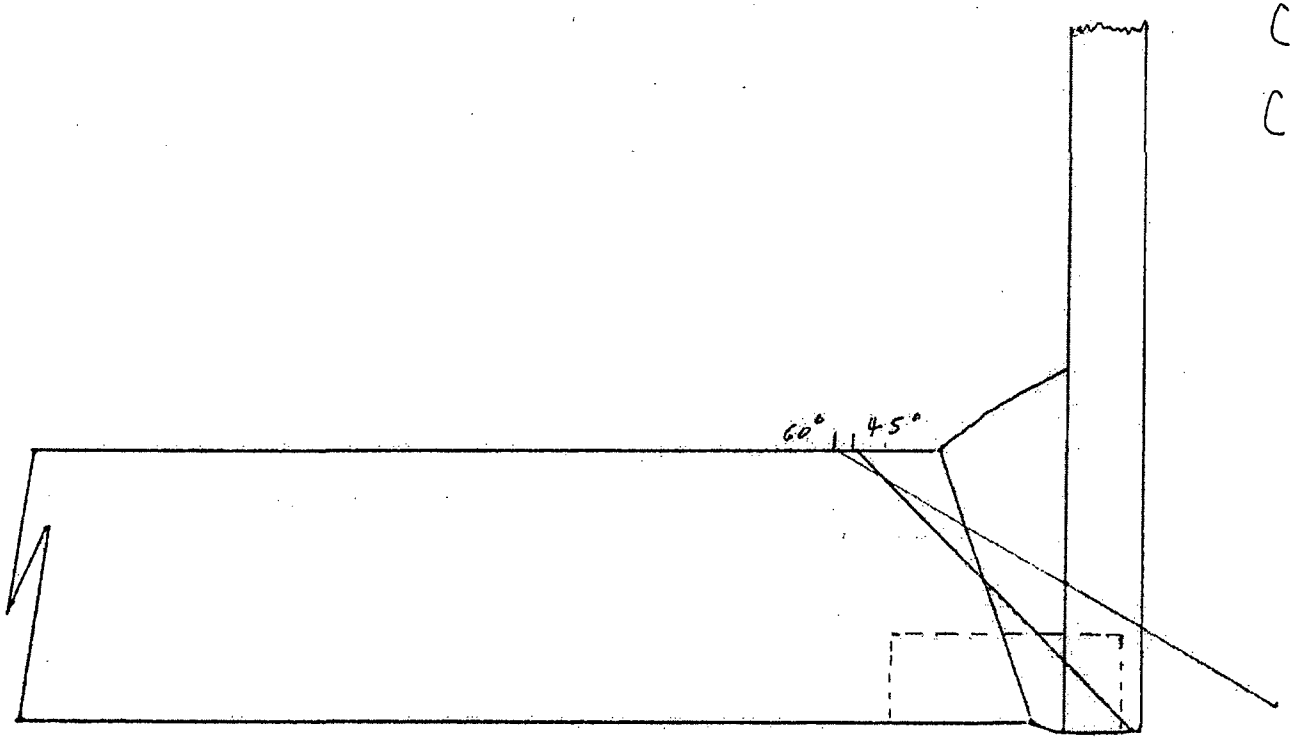
Comments: **Coverage Plot**

Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-001b.jpg



		AXIAL	CIRC	COVERAGE
SHELL SIDE	45°	51%	100%	45° 88%
	60°	97%	100%	60° 47%
FLANGE SIDE	45°	0	0	TOTAL 42.5%
	60°	0	0	COVERAGE

UT-07-005
C2.21
C1.2.3



		AXIAL	CIRC.
SHELL SIDE	45°	66%	100%
	60°	100%	100%
NOZZLE SIDE	45°	0	0
	60°	0	0

45° $\frac{165\%}{4} = 41\%$

60° $\frac{200\%}{4} = 50\%$

45.5% COVERAGE

NGG Nuclear Generation Group

Supplemental Report

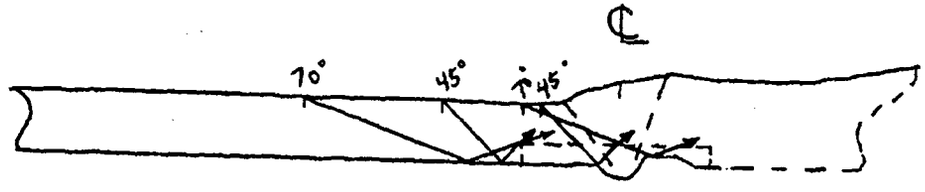
Report No.: UT-07-240

Page: 2 of 2

Summary No.: X121.020

Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-240.tif

PIPE FLOW VALVE



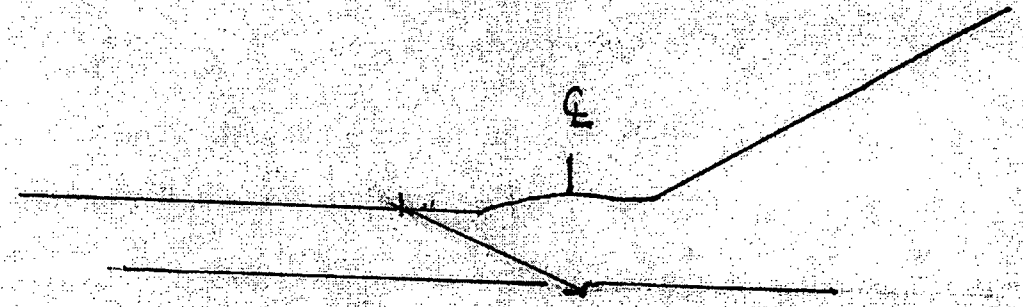
.398 .397 .395 .394 .400 .593 .598 .556

WELD LENGTH 34.7"
WELD WIDTH 0.6"

PROFILE TAKEN @ 0° TDC

Paul S Bleicher II 11-26-07 PSB

C2.1.507 D H-39



Dickey Michael 8-22-01

NGG Nuclear Generation Group

Supplemental Report

Report No.: UT-07-115

Page: 3 of 3

Summary No.: C2.1.1060

Examiner: Gahan, Timothy L. TG — Level: II-PDI — Reviewer: DAMON RIGSTLEY — Date: 12/1/07

Examiner: N/A — Level: N/A — Site Review: Michael Brennis — Date: 12/2/07

Other: N/A — Level: N/A — ANII Review: Wyatt, Thomas W. — Date: 12/3/07

Comments: **Coverage Calculations (Calculations provided by Shearer, Nicholas H. 11/16/07)**

Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-115b.jpg

SUMMARY # C2.1.1060

COMP. ID. MU-105F

LIMITED UT COVERAGE CALCULATION
TEE TO ELBOW

SCAN	% COVERAGE
AXIAL US	50
AXIAL DS	100
CIRC US	100
CIRC DS	100
	350 ÷ 4 = 87.5 % TOTAL COVERAGE

N SHEARER LEVEL III 11/16/07

Supplemental Report

Nuclear Generation Group

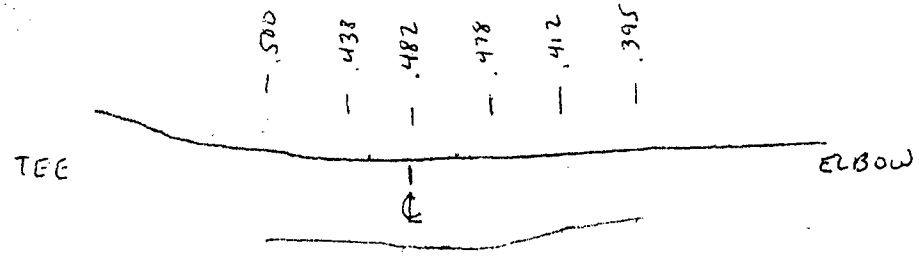
Report No.: UT-07-115

Summary No.: C2.1.1060

Examiner:	Gahan, Timothy L. TG	Level:	II-PDI	Reviewer:	DAMON PRIESTLEY — Date: 12/1/07
Examiner:	N/A	Level:	N/A	Site Review:	M Bocaccio — Date: 12/2/07
Other:	N/A	Level:	N/A	ANII Review:	Wyatt, Thomas W. — Date: 12/3/07

Comments: **Weld Profile (Profile taken by Shearer, Nicholas H. 11/16/07)**

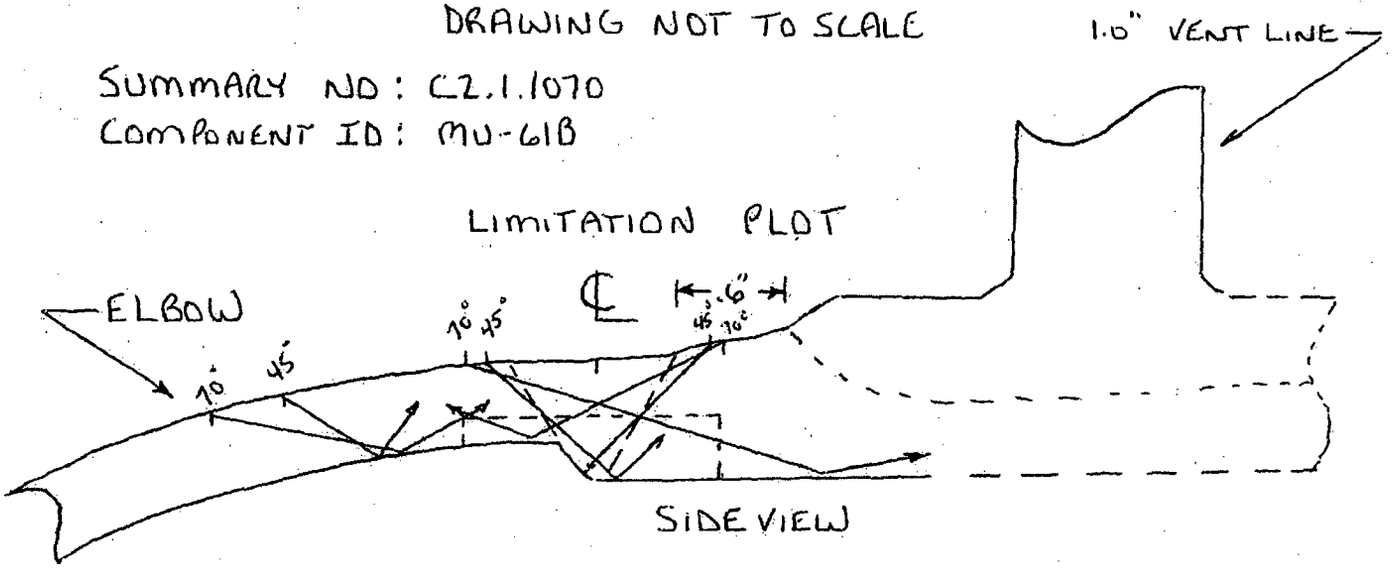
Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-115a.jpg

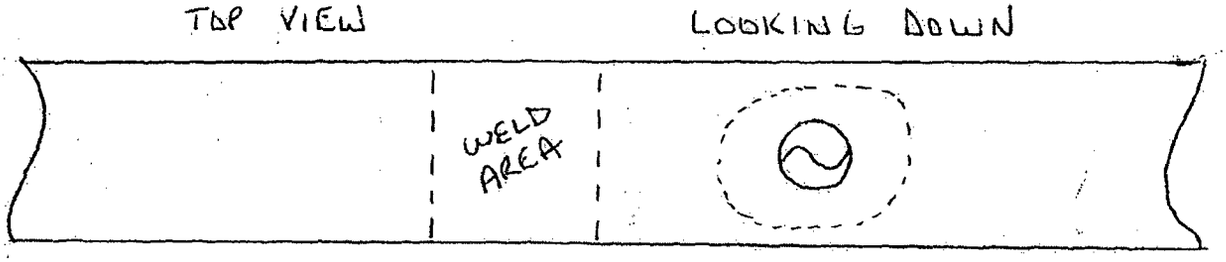


N. SHEARER LIII 11/16/07

DRAWING NOT TO SCALE

SUMMARY NO: C2.1.1070
COMPONENT ID: MU-61B





REQUIRED VOLUME = 3.42 IN^3

11.5" L
1.35" W
0.22 D

$11.5 \times 1.35" \times 0.22" = 3.42\ IN^3$

LENGTH OF WELD RESTRICTION = 3.0"

RESTRICTED VOLUME = 0.46 IN^3

$3.0" \times .675" \times 0.22 = 0.46\ IN^3$

UPSTREAM SCAN = 100%
DOWNSTREAM SCAN = 86.5%
CLOCKWISE SCAN = 100%
COUNTER CLOCKWISE SCAN: 100%

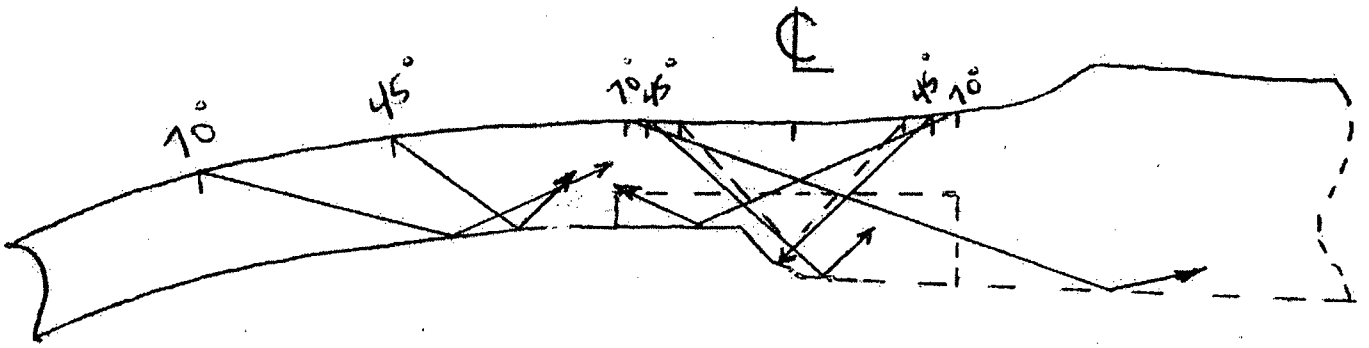
UT-07-110
C2.1.1070 1of2

86.5% TOTAL COVERAGE

ELBOW

FLOW →

TEE



.452 .460 .465 .466 .464 .652 .715 .945

WELD LENGTH: 11.5"

CAP WIDTH: 0.95"

PROFILE TAKEN @ 0° TDC

Paul S Bleche II 11/18/07

UT-07-110

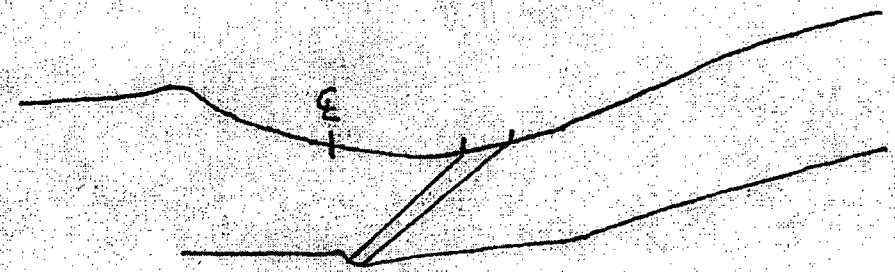
C2.1.1070 2of2

MLI 86

C2.1.1084

Expander

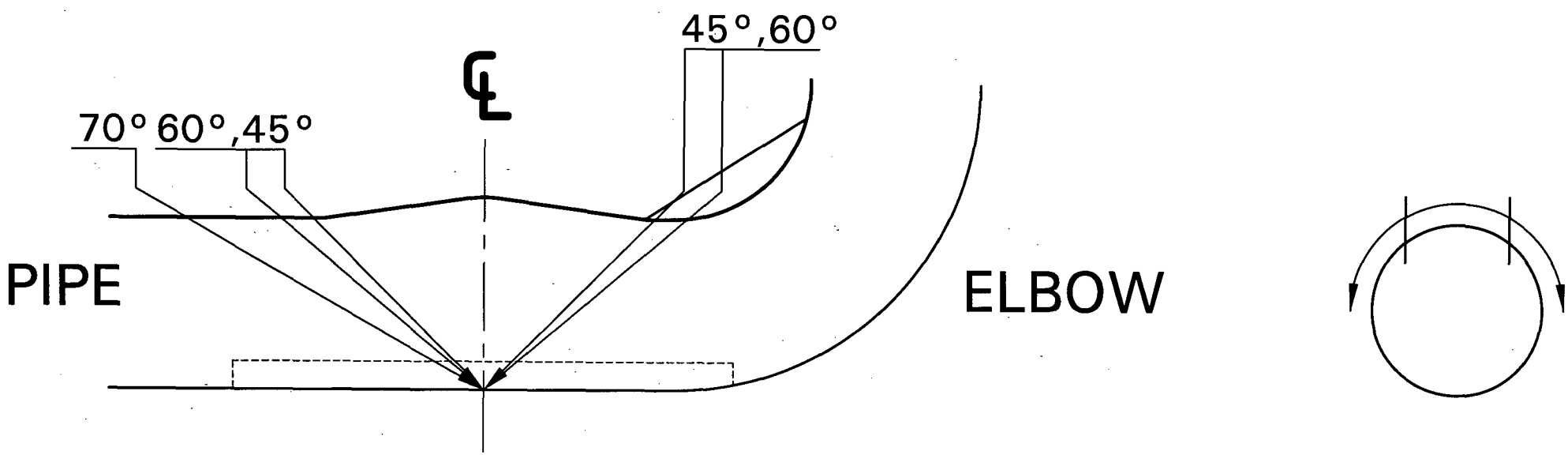
Valve



Flow →

Dickens Michael 8-7-01

C2.1.2117



NGG Nuclear Generation Group

Supplemental Report

Report No.: UT-07-092

Summary No.: C2.1.118

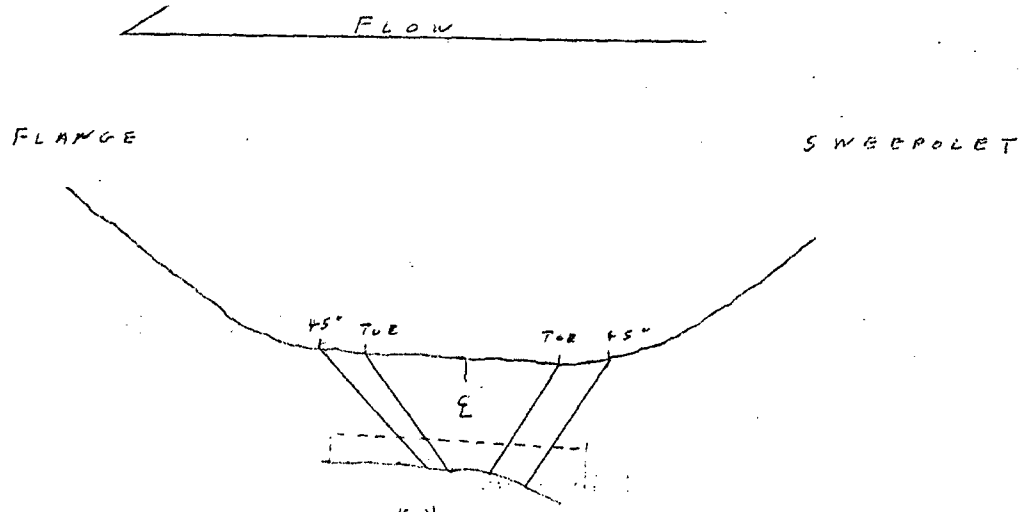
Examiner: Downs, William R. Level: III-PDI Reviewer: Damon Priestley L III Date: 11/28/07

Examiner: N/A Level: N/A Site Review: K W Blew Date: 11/28/07

Other: N/A Level: N/A ANII Review: Wyatt, Thomas W. Date: 12/4/07

Comments: **Weld Profile**

Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-092a and UT-07-093a.jpg



PROFILE AT RT "0" MARK (WORST CASE), TYPICAL PROFILE FOR C2.1.290 AND C2.1.118.

NGG Nuclear Generation Group

Supplemental Report

Report No.: UT-07-092

Page: 3 of 3

Summary No.: C2.1.118

Examiner: Downs, William R. BD Level: III-PDI Reviewer: DAMON PRIESTLEY L III Date: 11/28/07

Examiner: N/A Level: N/A Site Review: [signature] Date: 11/28/07

Other: N/A Level: N/A ANII Review: Wyatt, Thomas W. [signature] Date: 12/4/07

Comments: **Coverage Calculation**

Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-092b and UT-07-093b.jpg

COVERAGE FOR C2.1.290 AND C2.1.118

CIRCUMFERENTIAL SCAN

UPSTREAM 100%

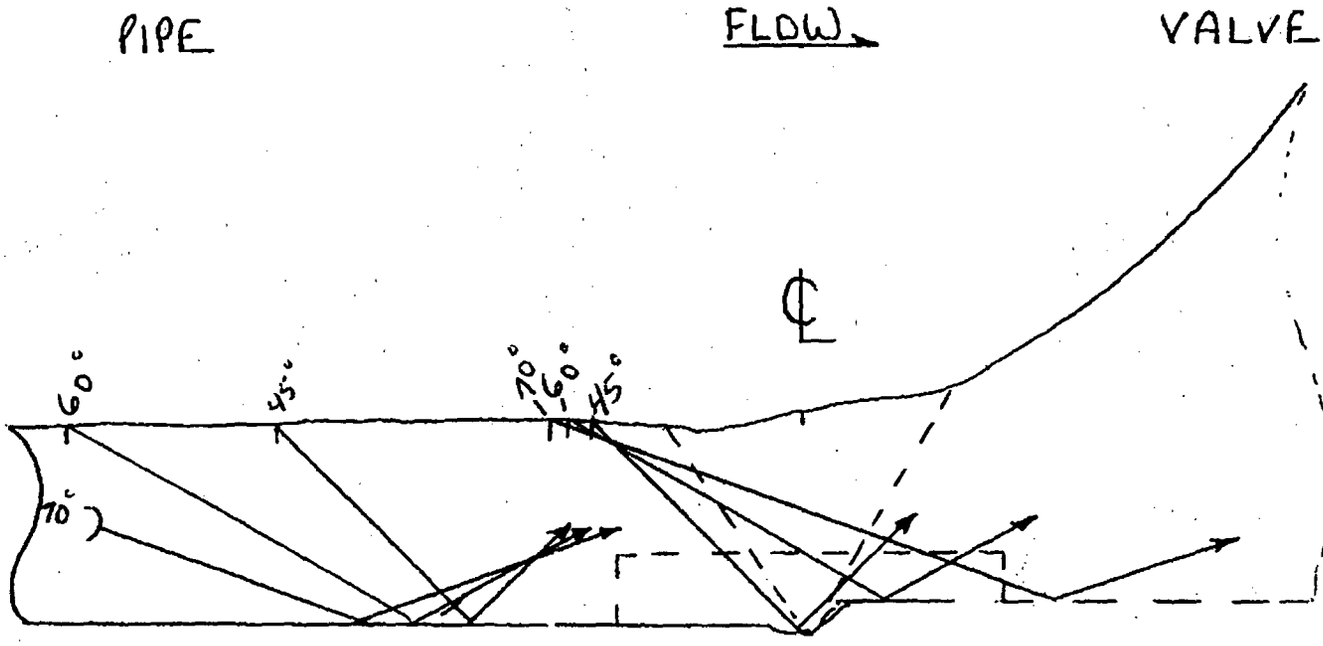
DOWNSTREAM 100%

AXIAL SCANNING 48%

60° (30° EACH WORST CASE AREA, TWO PER COMPONENT)
40% COVERAGE

300° 50% UPSTREAM AND DOWNSTREAM

74% COVERAGE



.994 .998 1.004 .997 1.050 .989

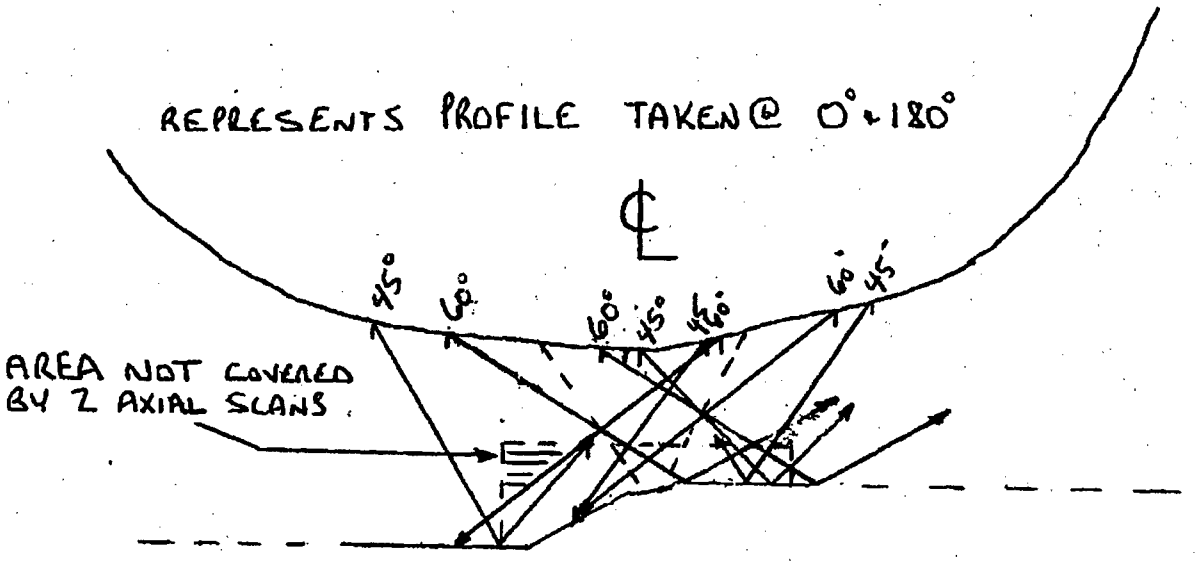
WELD LENGTH 75.6"
WELD WIDTH 1.4"

50% Coverage Pipe to Valve.

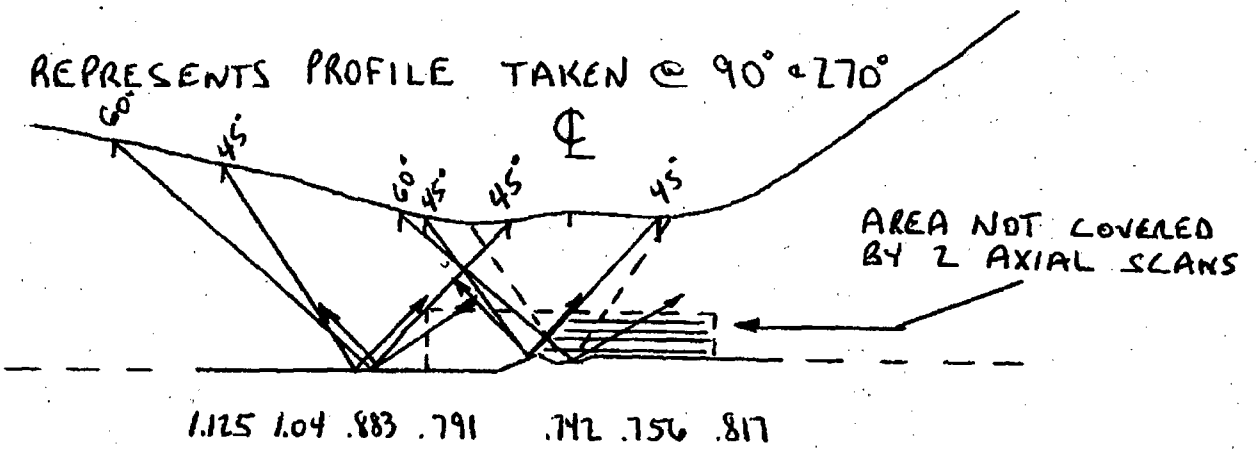
Paul S Bleuha II 11-16-07

C2.1.121

SWEEP-O-LET FLANGE



1.16 1.11 .789 .759 .780



1.125 1.04 .883 .791 .742 .756 .817

Paul S Bleuka II 11-14-07

C2, 1.122

SUMMARY NO: C2.1.122
COMPONENT ID: MS-42C

TOTAL EXAM COVERAGE = 8.29 IN^3 OR 100%

H = .26
W = 1.5 .26 x 1.5 x 21.25 = 8.29 IN^3
L = 21.25

MISSED 2 DIRECTIONAL AXIAL COVERAGE FROM 0° & 180° QUADRANTS.

H = 0.26
W = 0.4 $\frac{0.26 \times 0.4}{2} = 0.052$
L = 10.6 0.052 x 10.6 = 0.55 IN^3 OR 13.9% MISSED COVERAGE

86.1% (2 AXIAL DIRECTIONAL COVERAGE)

MISSED 2 DIRECTIONAL AXIAL COVERAGE FROM 90° & 270° QUADRANTS.

H = 0.26
W = 1.0 .26 x 1.0 x 10.6 = 2.76 IN^3 OR 66.67% MISSED COVERAGE
L = 10.6

33.33% (2 AXIAL DIRECTIONAL COVERAGE)

CW SCAN = 100%
CCW SCAN = 100%

0° & 180° QUADRANT SCANS = 86.1%

90° & 270° QUADRANT SCANS = 33.33%

319.43 ÷ 4 = 79.86% CODE COVERAGE

Paul S Blaha III 11-14-07

Supplemental Report

Report No.: UT-07-093

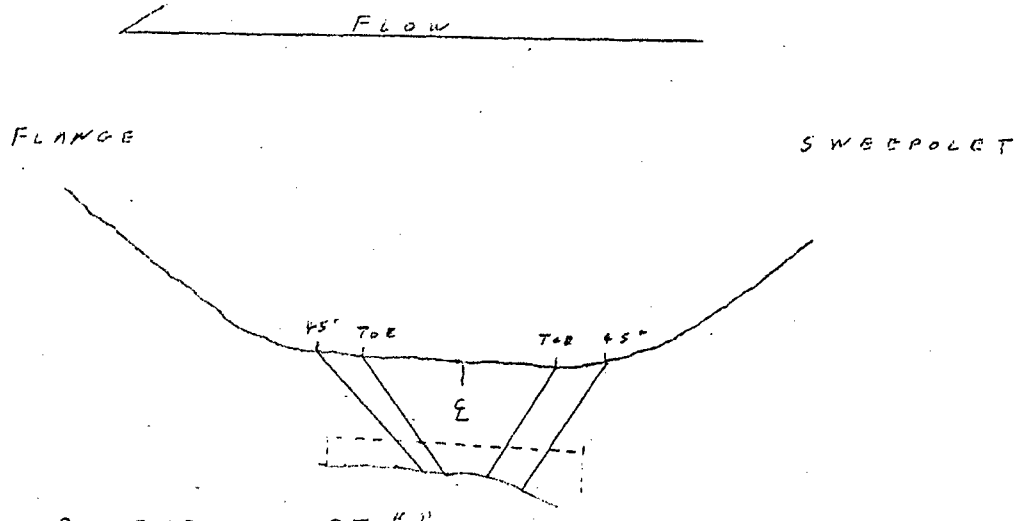
Page: 2 of 3

Summary No.: C2.1.290

Examiner:	Downs, William R.	Level:	III-PDI	Reviewer:	DAMON PRIESTLEY Lv III — Date: 11/28/07
Examiner:	N/A	Level:	N/A	Site Review:	MW Blew — Date: 11/28/07
Other:	N/A	Level:	N/A	ANII Review:	Wyatt, Thomas W. — Date: 12/4/07

Comments: **Weld Profile**

Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-092a and UT-07-093a.jpg



PROFILE AT RT "0" MARK (WORST CASE), TYPICAL PROFILE FOR C2.1.290 AND C2.1.118.

NGG Nuclear Generation Group

Supplemental Report

Report No.: UT-07-093

Page: 3 of 3

Summary No.: C2.1.290

Examiner:	Downs, William R. BD	Level:	III-PDI	Reviewer:		Date:	
Examiner:	N/A	Level:	N/A	Site Review:	MW Blew	Date:	11/28/07
Other:	N/A	Level:	N/A	ANII Review:	Wyatt, Thomas W.	Date:	12/4/07

Comments: **Coverage Calculation**

Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-092b and UT-07-093b.jpg

COVERAGE FOR C2.1.290 AND C2.1.118

CIRCUMFERENTIAL SCAN

UPSTREAM 100%

DOWNSTREAM 100%

AXIAL SCANNING 48%

60° (30° EACH WORST CASE AREA, TWO PER COMPONENT)
40% COVERAGE

300° 50% UPSTREAM AND DOWNSTREAM

74% COVERAGE

Supplemental Report

Report No.: UT-07-094

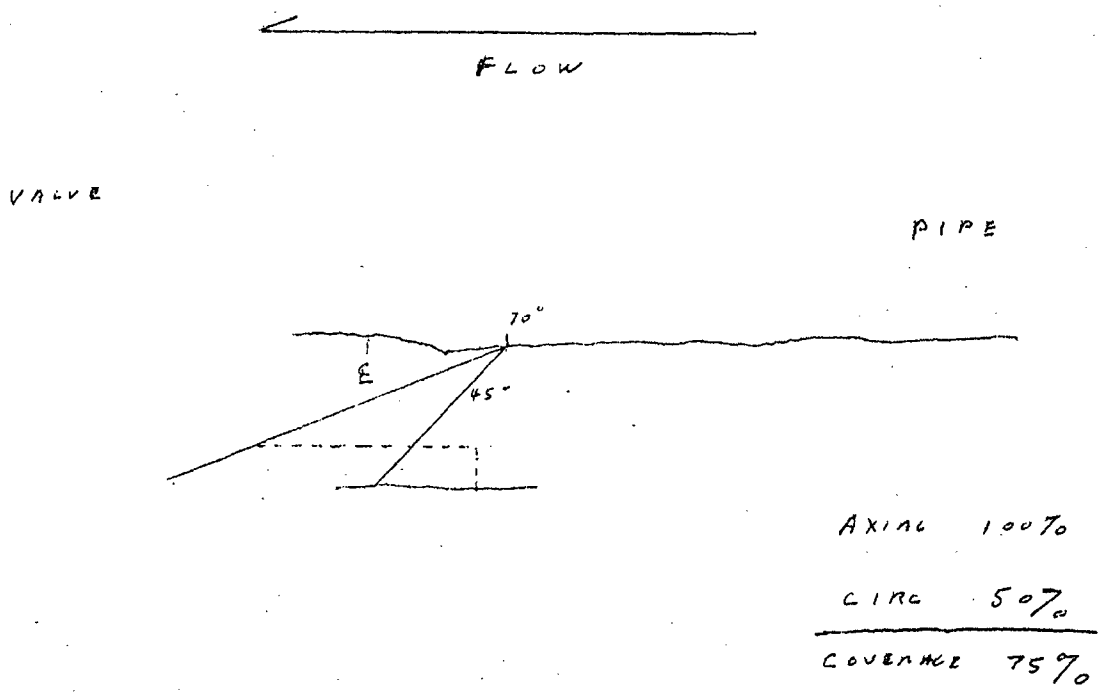
Page: 2 of 2

Summary No.: C2.1.8

Examiner:	Downs, William R.	Level:	III-PDI	Reviewer:	DAMON PRIESTLEY L III	Date: 11/24/07
Examiner:	N/A	Level:	N/A	Site Review:		Date: 11/28/07
Other:	N/A	Level:	N/A	ANII Review:	Wyatt, Thomas W.	Date: 12/4/07

Comments: **Weld Profile and Coverage Calculation**

Sketch or Photo: L:\Shared\ISIDATA\IDDEAL Documentation\RFO15\Linked Documents\UT-07-094a.jpg

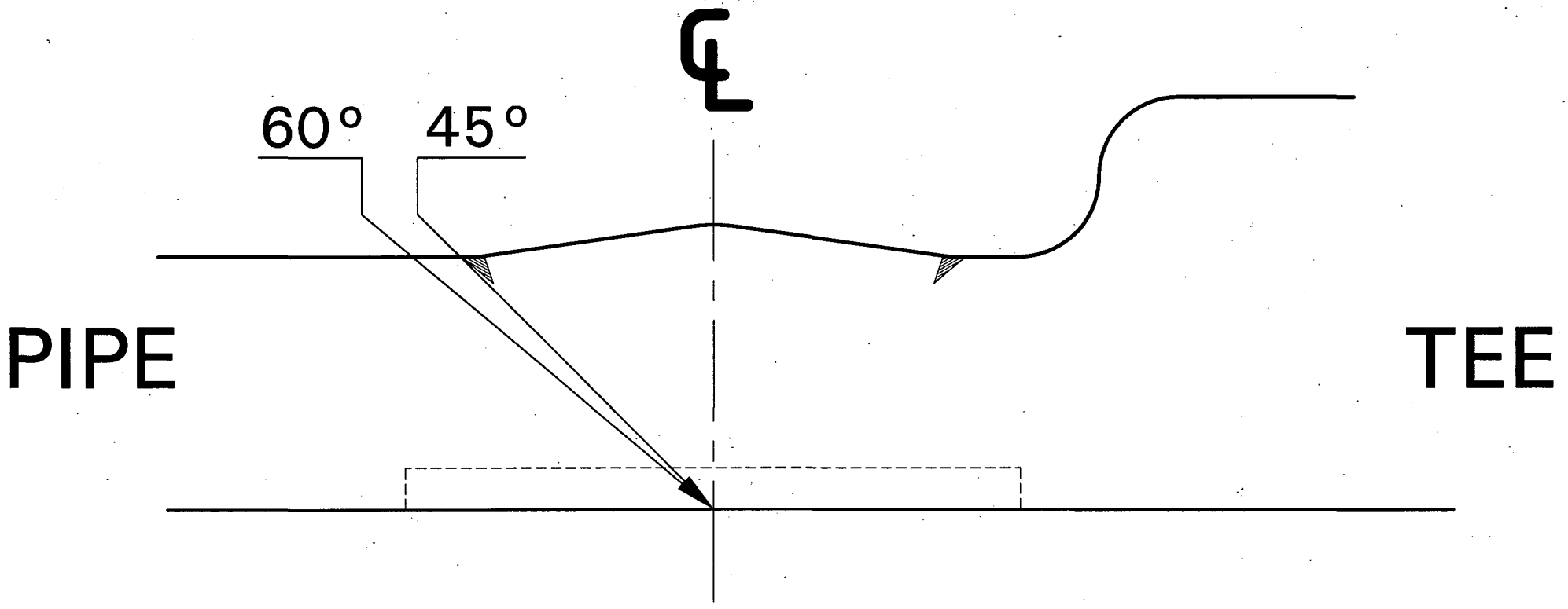


AXIAL 100%

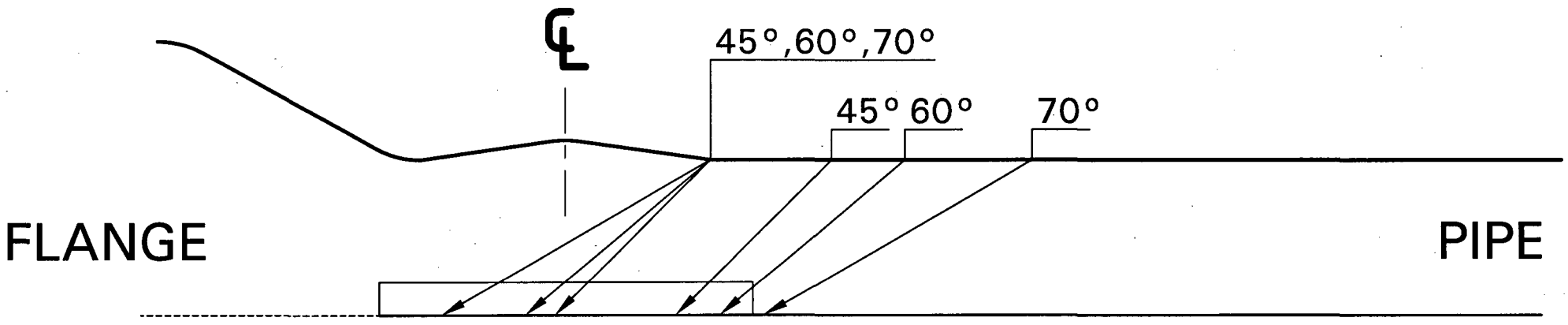
CIRC 50%

COVERAGE 75%

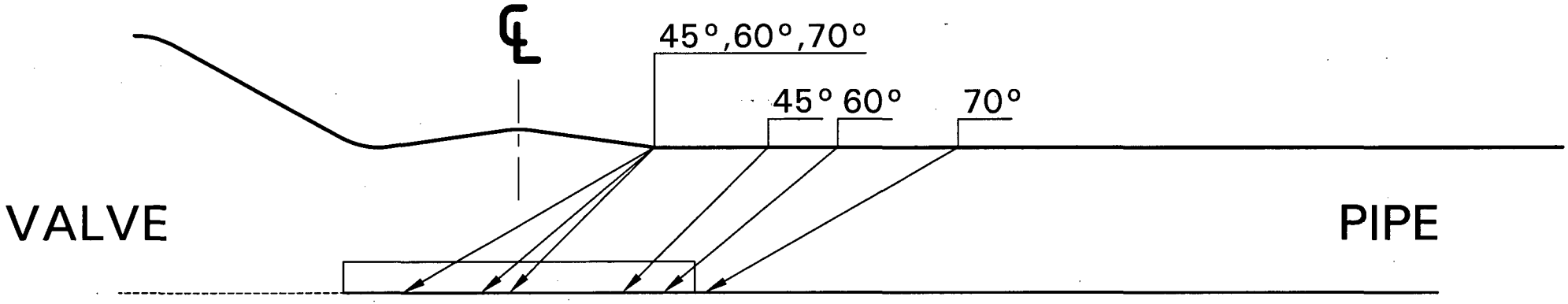
This drawing is representative of the following Summary Numbers; C2.1.543, C2.1.1031, C2.1.1098, C2.1.1272,C2.1.2174, C2.1.2199, and C2.1.2200. The cast Tee material causes the same limitations as a pipe to valve configuration. Only 50 percent coverage is credited for each exam. The drawing is not to scale.



The following drawing is representative of the following summary numbers; C2.1.190, C2.1.526, C2.1.527, C2.1.600, C2.1.2073, and C2.1.2078. The drawing is not to scale.



This drawing is representative of the following Summary Numbers;C2.1.192A, C2.1.605,C2.1.625, C2.1.104, C2.1.1477,C2.1.163, C2.1.167, C2.1.170, C2.1.184, C2.1.503, C2.1.542, C2.1.548, C2.1.1018, C2.1.1040, C2.1.1047, C2.1.1067, C2.1.1096, C2.1.1097, C2.1.1207, C2.1.1223, C2.1.2136, C2.1.2137, C2.1.2162, C2.1.2164, C2.1.2169, C2.1.2173, C2.1.2175, C2.1.2176, C2.1.2202, C2.1.2238, and C2.1.2240.
The drawing is not to scale.



PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ENCLOSURE 3

INSERVICE INSPECTION
RELIEF REQUEST #09-003-II
THIRD TEN-YEAR ISI INTERVAL

10 CFR 50.55a Request #09-003-II

Proposed Alternative
In Accordance with 10 CFR 50.55a(g)(6)(ii)(A)(5)
and 10 CFR 50.55a(a)(3)(i)

--Reactor Pressure Vessel Shell Weld Examination--

1. ASME Code Component(s) Affected

Reactor Pressure Vessel Lower Shell-to-Transition Piece Weld, Unique Identifier B1.2.1

Reactor Pressure Vessel Nozzle Belt Intermediate Shell Weld, Unique Identifier B1.2.3

Reactor Pressure Vessel Lower Shell to Lower Head Weld, Unique Identifier B1.2.2

Reactor Pressure Vessel Long Seam at 247 degrees, Unique Identifier B1.1.5

Reactor Pressure Vessel Long Seam at 67 degrees, Unique Identifier B1.1.6

Reactor Pressure Vessel Outlet Nozzle-to-Shell Weld, Unique Identifier B1.4.7A

Reactor Pressure Vessel Outlet Nozzle-to-Shell Weld, Unique Identifier B1.4.8A

2. Applicable Code Edition and Addenda

American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, Section XI, 1989 Edition, no addenda.

3. Applicable Code Requirement

ASME Code, Section XI, Sub-article IWB-2500 states, in part, "Components shall be examined and tested as specified in Table IWB-2500-1." Table IWB-2500-1 requires an examination of applicable Class 1 pressure retaining-welds, which includes essentially 100 percent of weld length once during the ten-year ISI interval for the following Code Categories:

Category B-A: Item Numbers B1.11 and B1.12
Category B-D: Item Number B3.90

10 CFR 50.55a(g)(6)(ii)(A)(2) requires licensees to implement the examination requirements of the 1989 Edition of ASME Section XI for reactor vessel shell welds. Subsection IWB, Table IWB-2500-1, "Examination Category B-A," Item B1.11, requires a 100 percent volumetric examination of all shell welds for the third ten-year ISI interval. As defined in 10 CFR 50.55a(g)(6)(ii)(A)(2), 100 percent, as used in Table IWB-2500-1, means more than 90 percent of the examination volume of each weld, where the reduction in coverage is due to interference by another component, or part geometry.

Code Case N-460 permits a reduction in examination coverage of Class 1 and Class 2 welds provided the coverage reduction is less than 10 percent. CR-3 has adopted Code Case N-460 in the Inservice Inspection (ISI) Program Plan, as permitted by NRC Regulatory Guide 1.147, Revision 15.

4. Determination of Limits of Weld Volume Examination

Examinations were performed using two Trans World System manipulators and AREVA's Automated Data Acquisition and Analysis System, ACCUSONEX. All ultrasonic examinations were performed using examination procedures and personnel qualified by demonstration in accordance with the requirements of Appendix VIII of the ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition with Editions up to and Addenda through 2000, as modified by the Performance Demonstration Initiative (PDI) program. These examinations were performed to the acceptance standards of ASME Boiler and Pressure Vessel Code, Section XI, 1989 edition, no addenda. These examinations were performed to the maximum extent possible.

Examinations of the reactor vessel circumferential, longitudinal, and nozzle-to-shell welds, scanned from the vessel shell, were performed using 45 degree shear wave, 45 degree longitudinal wave and 70 degree longitudinal wave transducers. The circumferential and longitudinal welds were examined by scanning from four opposing beam directions such that the sound energy from the angle beams pass through the weld material and adjacent base material from each direction to the maximum extent possible. The nozzles to shell welds (inlet and outlet) were scanned from the vessel shell using four opposing beam directions and from the bore with beams looking radially. The scans from the bore used 45 degree shear wave and 15 degree longitudinal wave transducers. The inside radius sections of the inlet and outlet nozzles were also examined by enhanced visual testing.

For each required scan, the amount of sound beam that passed though the required examination volume has been plotted on scaled cross sectional drawings of each component configuration (see Attachment B). The examination coverages reported in the following table have been determined by averaging the amount of coverage obtained from each of the required scans for the required examination volume. These examinations are limited by part geometry or interferences with other components, such that the reduction in coverage is greater than 10 percent.

Identifier	Description	Category	Item	Coverage	Limitation
B1.2.1	RPV Lower Shell to-Transition Piece	B-A	B1.11	46	The core guide lugs and flow distributors interfere with scan paths.
B1.2.3	RPV Nozzle Belt Intermediate Weld	B-A	B1.11	90	Inlet and outlet nozzles interfere with the scan paths.
B1.2.2	RPV Transition Piece to Bottom Head	B-A	B1.11	0	Core guide lugs and flow distributors prevent inspection
B1.1.5	RPV Long Seam, at 247 degrees	B-A	B1.12	88.1	Core guide lugs and flow stabilizers prevented full movement of the head

Identifier	Description	Category	Item	Coverage	Limitation
B1.1.6	RPV Long Seam, at 67 degrees	B-A	B1.12	88.1	Core guide lugs and flow stabilizers prevented full movement of the head
B1.4.7A	A Outlet Nozzle to RPV Shell Weld	B-D	B3.90	69.8	Surface Geometry
B1.4.8A	B Outlet Nozzle to RPV Shell Weld	B-D	B3.90	69.8	Surface Geometry

Examination Details

Component B1.2.1: Reactor Pressure Vessel Lower Shell-to-Transition Piece Weld

The pre-service records reported the examination coverage as "best effort" due to the interferences with core guide lugs and flow stabilizer vanes (see Attachment A, FPC Drawing 135546E, for lug and vane locations). No pre-service indications were recorded.

During the First Ten-Year ISI Interval examination, the core guide lugs and flow stabilizer vanes were reported as limitations and no indications were recorded.

During the Second Ten-Year ISI Interval examination, the average amount of coverage was calculated to be 29 percent.

During the Third Ten-Year ISI Interval examination, the average amount of coverage has been calculated to be 46 percent. Twelve (12) sections of the weld between the 12 lugs were accessible for examination. No unacceptable indications have been recorded.

Although the weld area beneath the lugs received no ultrasonic examination coverage, no flaws were identified during a remote VT-3 visual examination of the lug areas. This weld is located outside of the area of highest irradiation in the reactor vessel. (See Attachment B for coverage data.)

Component B1.2.3: Reactor Pressure Vessel Nozzle Belt Intermediate Weld

No limitation areas were reported during the pre-service examination of this component. The weld was examined to the maximum extent possible. No relevant pre-service indications were recorded.

During the First Ten-Year ISI Interval examination, only 5 percent of the weld length was examined to satisfy the requirements of Table IWB-2500 of the 1974 Edition of ASME Section XI through Summer 1975 Addenda. No indications were recorded.

During the Second Ten-Year ISI Interval examination, a total of 75 percent of the weld was examined. No unacceptable indications were recorded.

During the Third Ten-Year ISI Interval examination, a total of 90 percent of the weld was examined. The remaining ten percent was not accessible due to scanning interferences with the inlet nozzle openings and the outlet nozzle boss extensions. (See Attachment B for coverage data.)

Component B1.2.2: Reactor Vessel Transition Piece to Bottom Head Weld

The subject weld is the reactor vessel transition-piece-to-bottom-head-weld. This weld is located below the beltline region and is not subject to the majority of the neutron flux escaping from the core. An evaluation of neutron embrittlement as a potential damage mechanism has been performed with the conclusion that service induced degradation of the transition-piece-to-bottom-head-weld as a result of corrosion, fatigue, nuclear or thermal embrittlement mechanisms is extremely unlikely.

This weld has been visually and ultrasonically inspected once during pre-service inspection (essentially 100 percent coverage). The volumetric examination method utilized during the pre-service inspection was performed with the manual contact method. There were no reportable or recordable indications detected during this inspection.

During the First Ten-Year ISI Interval vessel inspection, the weld was partially inspected (approximately 5 percent) using the immersion method of ultrasonic inspection. This was acceptable as per the ASME Boiler and Pressure Vessel Code, Section XI, 1974 Edition through the Summer of 1975 Addenda, and Regulatory Guide 1.150. The extent of this examination was acceptable since the 1974 Edition of ASME Section XI, Table 2500-1, Category B-A, only required the examination of 5 percent of this weld. The examination was performed using the ARIS II remote scanner, a device that utilized immersion ultrasonic techniques. The examination revealed no baseline indications, no reportable indications and no recordable indications.

Although the use of immersion testing allowed the weld to be inspected with inspection equipment at a distance of up to twenty inches away from the weld, access for examination of this weld was limited by the flow stabilizers, the core support lugs and the incore instrumentation nozzles.

Since that inspection was performed, improvements in volumetric examination methods have shown the contact method to be much more accurate and reliable than the immersion method. As a result, equipment designed to use the immersion technique has been abandoned and modern reactor vessel inspection equipment has been designed to utilize the contact examination method.

Relief was granted from this inspection during the Second Ten-Year ISI Interval under Relief Request #95-030 (TAC NO. M93755).

The Third Ten-Year ISI Interval volumetric inspections were not able to be performed using modern automated reactor vessel inspection equipment. The implementation of the requirements of Appendix VIII of the ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition with Editions up to and Addenda

through 2000, as modified by the PDI program, place stringent controls on the methodology utilized in performing this inspection.

Access to the weld from the vessel exterior presents safety and As Low As Reasonably Achievable hazards. Access to the weld to perform the inspection from the outside using a manual contact ultrasonic method would require concrete removal in the cavity and suspension of an inspection team between the exterior of the vessel and inside the shield wall by harnesses.

The reactor vessel interior was subject to VT-1 and VT-3 inspections in Refueling Outage 15 during the Fall of 2007 which included all welds and interior attachments. VT-2 inspections on the exterior of the vessel were performed during the inservice leak test performed during start-up. No indications were identified during these inspections.

Components B1.1.5 and B1.1.6: RPV Long Seam

The Reactor Pressure Vessel (RPV) long seam welds on the lower head to lower shell section are limited by the geometry of the core positioning lugs and the flow stabilizers(see Attachment A, FPC Drawings 135544E and 135546E).

The location of the obstructions prevented the scanning head of the inspection tool to achieve required coverage. During the Second Ten-Year ISI Interval, 94 percent coverage was achieved using a different inspection methodology that was not approved through the PDI process.

Inspections performed as directed by Appendix VIII of the ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition with Editions up to and Addenda through 2000, as modified by the PDI program, are more stringent in transducer selection which allowed for 88.1 percent required coverage for these longitudinal welds. No unacceptable indications have been identified during the Pre-service, First Ten-Year ISI Interval, Second Ten-Year ISI Interval, or Third Ten-Year ISI Interval examinations of these longitudinal welds. (See Attachment B for coverage data.)

Components B1.4.7A and B1.4.8A: Reactor Pressure Vessel Outlet Nozzle to Shell Welds

The outlet nozzle extension geometry has provided the same limitation area during the Pre-service, First Ten-Year ISI Interval, and Second Ten-Year ISI Interval volumetric examinations of these nozzle welds (see Attachment A, FPC Drawing 135540E). The boss extension limits the circumferential scan coverage to 26 percent. However, 100 percent of the required weld volume and adjacent base material has received 2 axial angle beam scans from the nozzle bore. No unacceptable indications have been identified during the Pre-service, First Ten-Year ISI Interval, Second Ten-Year ISI Interval or Third Ten-Year ISI Interval examinations of these outlet nozzle-to-shell welds. (See Attachment B for coverage data.)

5. Proposed Alternative and Basis for Use

None. In lieu of the ASME Code requirement of essentially 100 percent volumetric examination, CR-3 proposes ultrasonic inspections of accessible areas to the maximum extent practical, given the design configuration of the Reactor Pressure Vessel Welds, and VT Inspections of all accessible areas sufficient for continued safe operation. Additionally, system leak rate limitations are imposed by Improved Technical Specification 3.4.12 and reactor building normal sump rate monitoring provides additional assurance that any leakage would be detected prior to gross failure of the component.

6. Duration of proposed Alternative

Relief is requested for the Third Ten-Year ISI Interval of the Inservice Inspection Program for CR-3 which was effective from August 14, 1998, ending August 13, 2008.

7. Precedents (Optional)

NRC granted relief for Augmented Reactor Vessel Shell Weld Examination under Relief Request #98-009-II on August 5, 1999 (TAC NO. MA1642).

NRC granted relief for RPV Lower Head to Bottom Shell Weld under Relief Request #95-030 on April 14, 1996 (TAC NO. M93755).

8. References (Optional)

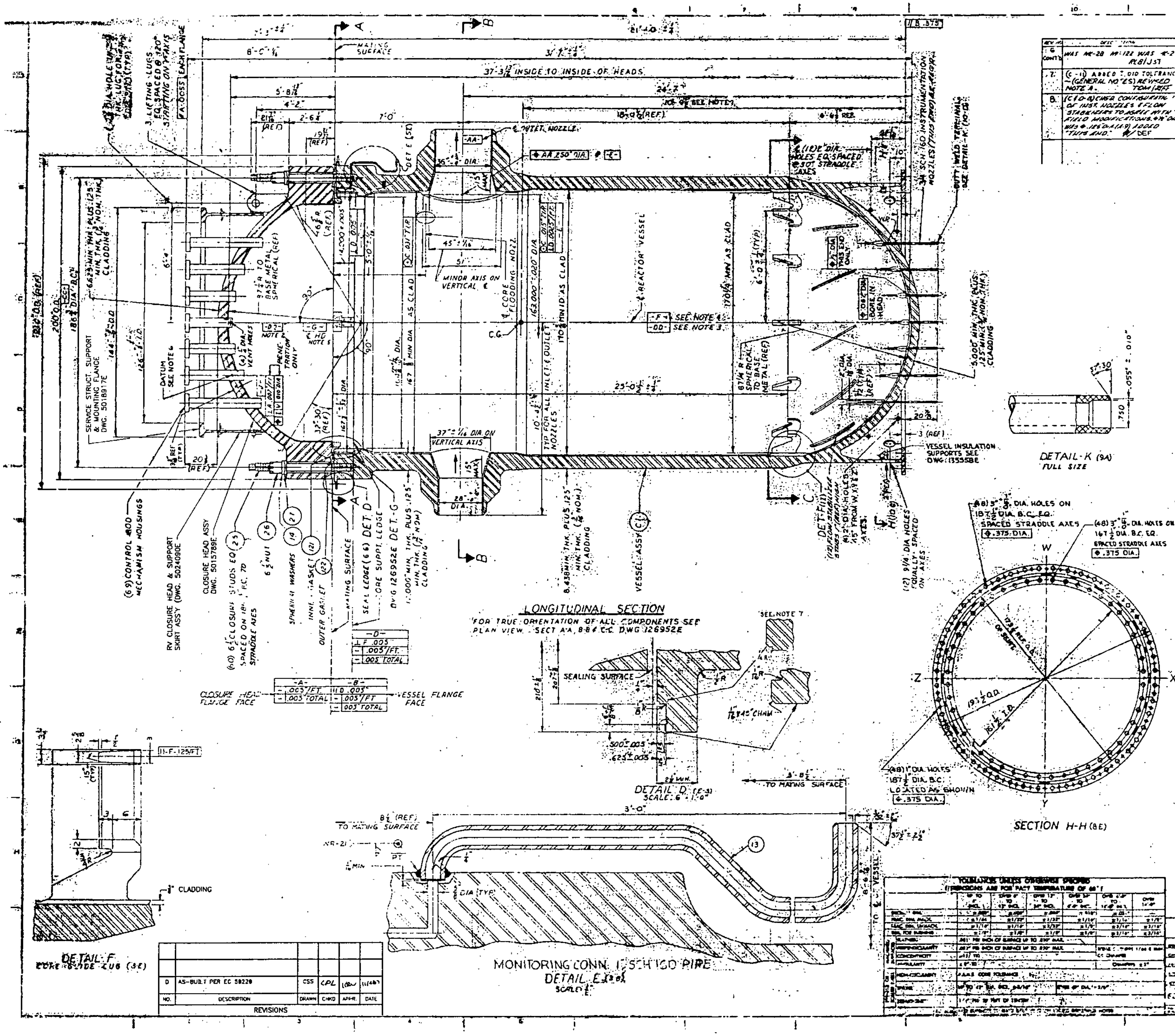
ENCLOSURE 3

ATTACHMENT A

VESSEL DRAWINGS

INSERVICE INSPECTION
RELIEF REQUEST #09-003-II
THIRD TEN-YEAR ISI INTERVAL

126951E	Arrangement Reactor Vessel Long Section
135540E	Reactor Vessel Detail and Sub-Assembly Outlet Nozzles
135543E	Vessel Radiographic Outline
135544E	Vessel Head and Support Assembly Detail
135546E	Vessel Assembly and Final Machining



LIST OF DWG. 102968C

NOTES

1. CG SHOWN IS FOR DRY VESSEL & HEAD ASSEMBLED WITHOUT INSULATION.
2. IN THE CLOSURE HD -DD- IS DEFINED AS ... OF THE KEYWAY ℄'S @ -A- AND ...
3. IN THE VESSEL -DD- IS DEFINED AS THE INTERSECTION OF THE KEY ℄'S @ -G- AND ...
4. CENTERLINE -F- IS DEFINED AS A VERTICAL LINE THRU THE ℄ OF DIAS. -C- & -E-
5. CENTERLINE -G- IS DEFINED AS A VERTICAL LINE THRU THE CTR OF DIA. -CC- AND ...
6. VERTICALITY OF .001/FT. FOR CONTROL ROD NOZZLES ORIGINATES AT DATUM INDICATED.
7. RADIUS ... ON SEAL LEDGE AT DETAIL "D" FOR WELDED SEAL PLATE, SEE DWG. ...

GENERAL NOTES

A. VESSEL IS DESIGNED, FABRICATED, INSPECTED, AND TESTED IN ACCORDANCE WITH ASME CODE, SECTION III, 1965 EDITION AND ...
A. ADDENDA AS IDENTIFIED BY THE CERTIFIED DESIGN ...
B. CERTIFIED DESIGN SPECIFICATION
C. CERTIFIED STRESS REPORT

B. DESIGN CONDITIONS:
PRESSURE 2500 P.S.I.G.
TEMPERATURE 650°F
HYDROSTATIC TEST PRESSURE 3125 P.S.I.G.
HYDROSTATIC TEST TEMPERATURE ...

C. ALL WELDING, POST WELD HEAT TREATMENT AND NON-DESTRUCTIVE TESTING OF WELDS ... WITH APPLICABLE WELD SPECIFICATION NUMBER ... SHOWN ON DETAIL DRAWING ...

D. ALL CLADDING & MACHINED SURFACES TO HAVE ... FINISH OR BETTER EXCEPT AS NOTED ON DETAIL DWG. EXTERNAL SURFACES TO HAVE 500 RMS FINISH EXCEPT AS NOTED ON DETAIL DWG'S.

E. ALL EXPOSED CARBON STEEL SURFACES EXCEPT THE BOTTOM OF VESSEL SUPPORT ... TO RECEIVE ONE ... COAT OF HIGH HEAT PAINT.

F. VESSEL IS CLEANED PRIOR TO SHIPMENT IN ACCOR WITH APPROVED CLEANING PROCEDURE.

G. WEIGHTS (APPROX.)
VESSEL ... 478,900 LBS
CLOSURE HEAD ... 162,400 LBS.
STUDS, NUTS & WASHERS ... 38,400 LBS.

H. "SURFACE FINISHES MAY HAVE ISOLATED TOOL MARKS OR SIMILAR DEPRESSIONS PROVIDED THEY ARE MINOR IN NATURE, OR NOT ON SURFACES WHICH ARE TO BE USED TO SEAL PRESSURE BOUNDARIES, AND DO NOT VIOLATE MINIMUM THICKNESS REQUIREMENTS. ALL UPSET OR RAISED METAL IS TO BE REMOVED AND SHARP EDGES OF ALL DEPRESSIONS MUST BE FAIRED TO AT LEAST 3 TO 1."

FILE COPY

NO.	DESCRIPTION	DRAWN	CHKD	APPR.	DATE
D	AS-BUILT PER EC 58228	CSS	CPL	[illegible]	[illegible]

REVISIONS

FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT #3

ARRANGEMENT REACTOR VESSEL LONG. SECTION

126951E REV. 8

PE REV. D

KEY #M000477

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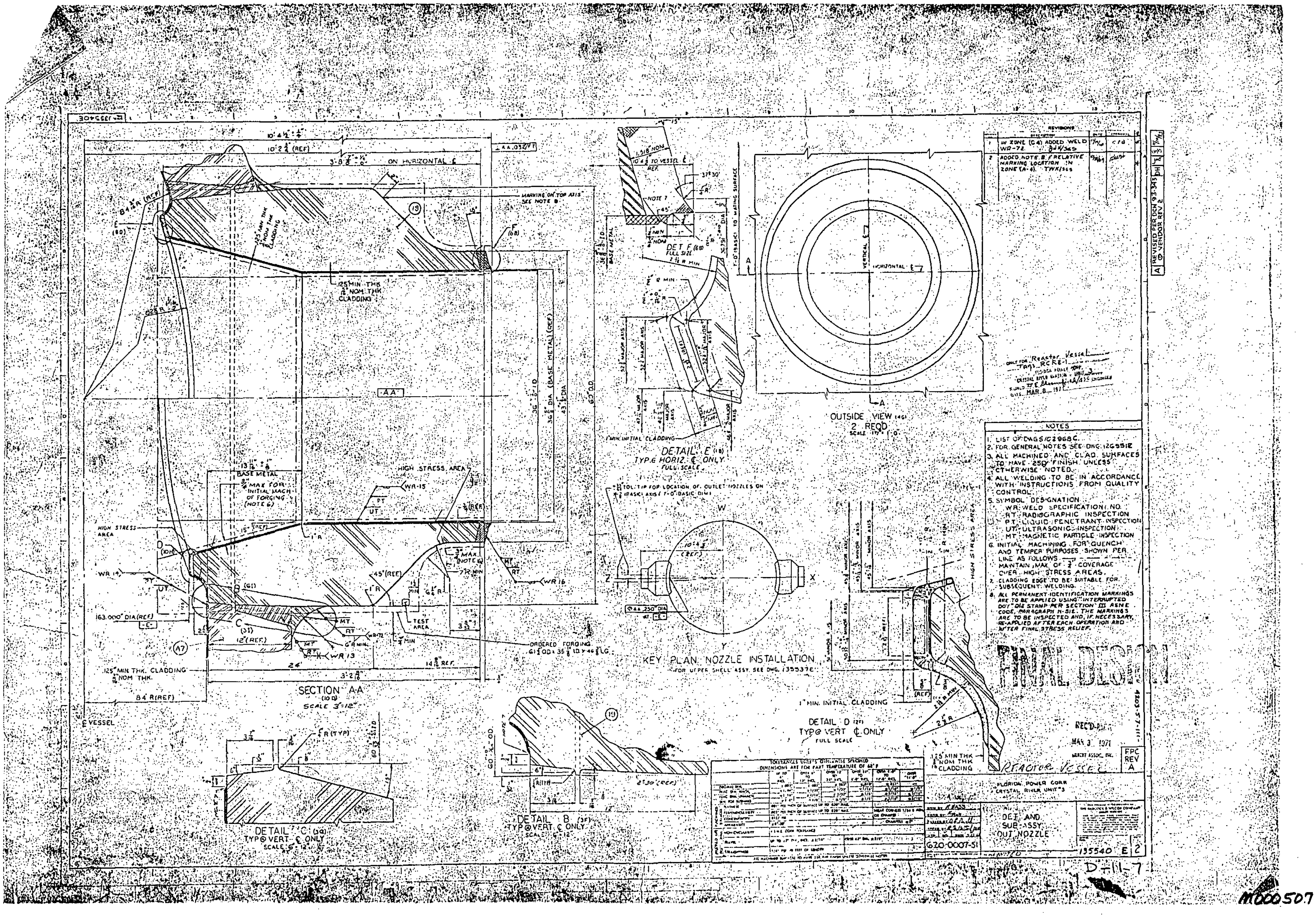
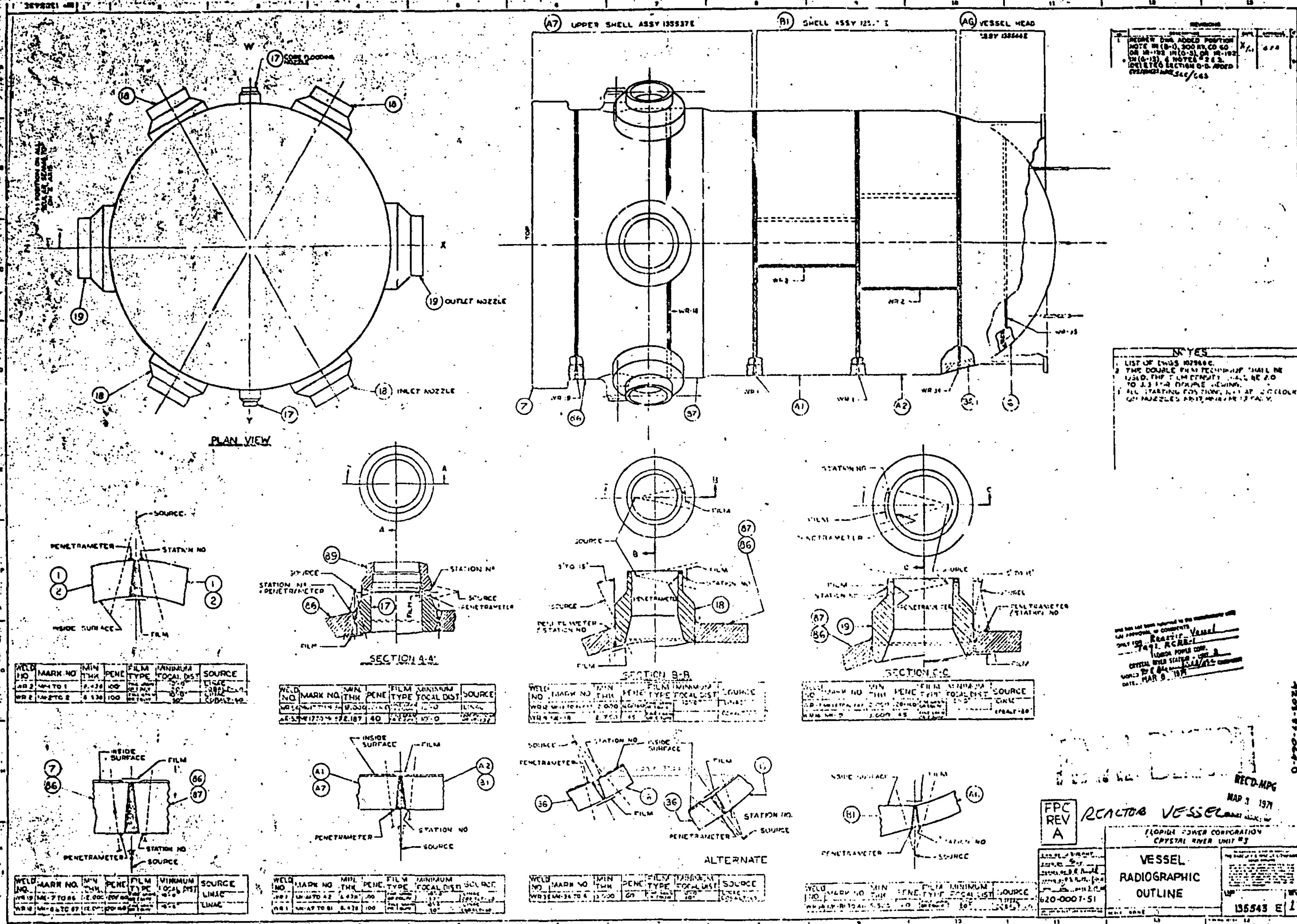
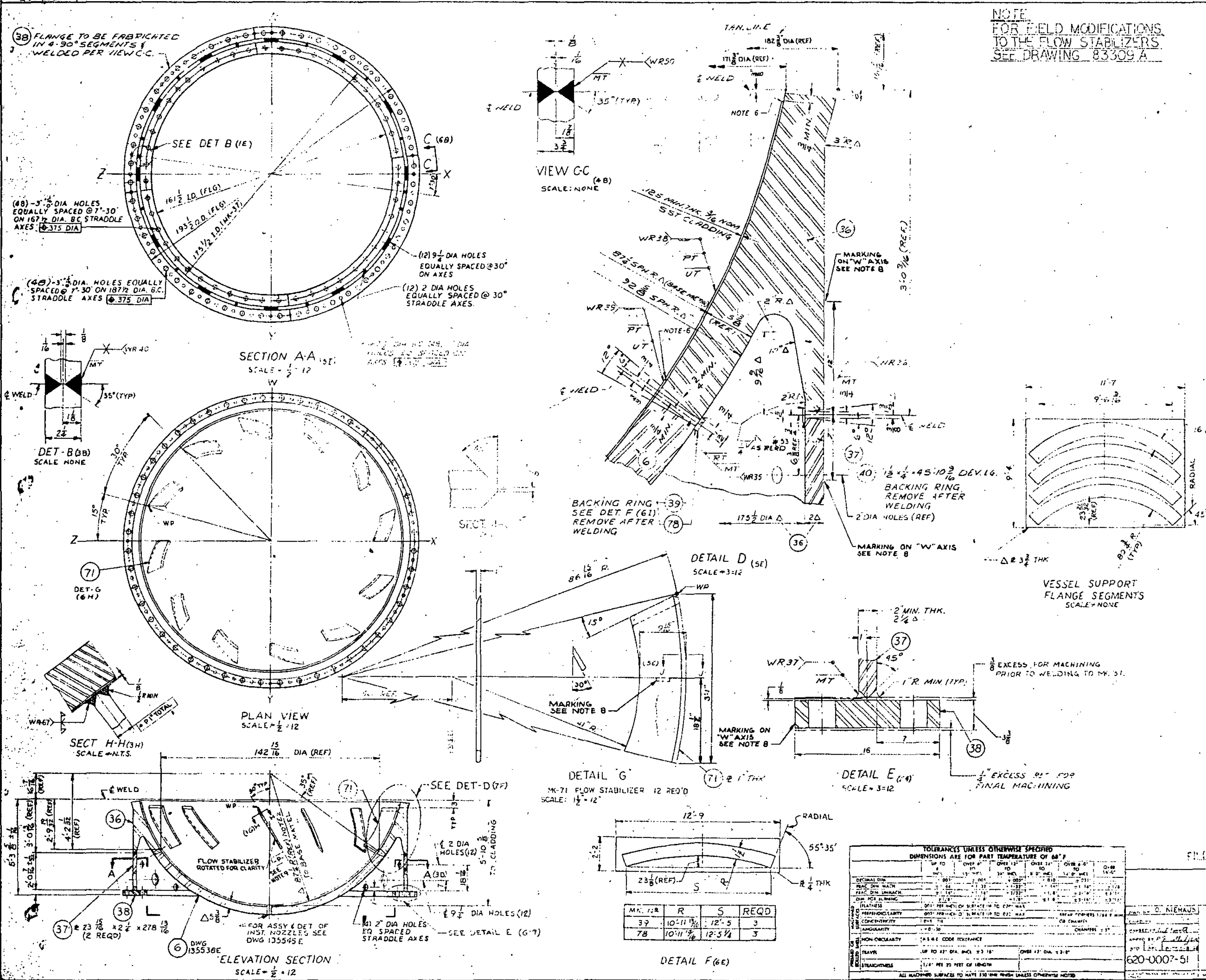

SECTION A-A
SCALE 3"=12"
DETAIL F
FULL SIZE
DETAIL E
TYP @ HORIZ. ℄ ONLY
FULL SCALE
OUTSIDE VIEW
2 REQD
KEY PLAN NOZZLE INSTALLATION
DETAIL D
TYP @ VERT ℄ ONLY
FULL SCALE
DETAIL C
TYP @ VERT ℄ ONLY
DETAIL B
TYP @ VERT ℄ ONLY
HIGH STRESS AREA
ORDERED FORGING
NOTES
1. LIST OF DWGS / C2968C.
2. FOR GENERAL NOTES SEE DWG 126951E
3. ALL MACHINED AND CLAD SURFACES TO HAVE 250 FINISH UNLESS OTHERWISE NOTED.
4. ALL WELDING TO BE IN ACCORDANCE WITH INSTRUCTIONS FROM QUALITY CONTROL.
5. SYMBOL DESIGNATION
WR WELD SPECIFICATION NO.
RT RADIOGRAPHIC INSPECTION
PT LIQUID PENETRANT INSPECTION
UT ULTRASONIC INSPECTION
MT MAGNETIC PARTICLE INSPECTION
6. INITIAL MACHINING FOR QUENCH AND TEMPER PURPOSES SHOWN PER LINE AS FOLLOWS
MAINTAIN MAX OF ¾" COVERAGE OVER HIGH STRESS AREAS.
7. CLADDING EDGE TO BE SUITABLE FOR SUBSEQUENT WELDING.
8. ALL PERMANENT IDENTIFICATION MARKINGS ARE TO BE APPLIED USING "INTERRUPTED DOT" DIE STAMP PER SECTION III ASME CODE, PARAGRAPH N-512. THE MARKINGS ARE TO BE INSPECTED AND, IF NECESSARY, RE-APPLIED AFTER EACH OPERATION AND AFTER FINAL STRESS RELIEF.
FINAL DESIGN
FLORIDA POWER CORP
CRYSTAL RIVER UNIT 3
DET AND SUB-ASSY OUT NOZZLE
135540 E 2
620-0007-51
D-11-7
M000507



UPPER SHELL ASSY
SHELL ASSY
VESSEL HEAD
CORE FLOODING NOZZLE
OUTLET NOZZLE
INLET NOZZLE
PLAN VIEW
SECTION A-A
SECTION B-B
SECTION C-C
SOURCE
PENETRAMETER
STATION NO
INSIDE SURFACE
FILM
ALTERNATE
WELD NO.
MARK NO.
MIN THK
PENE
FILM TYPE
MINIMUM FOCAL DIST
SOURCE
LINAC
NOTES
REVISIONS
A REVISED PER DCN 93-323
© VENDOR REV. 1
FPC REV A
REACTOR VESSEL
FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT #3
VESSEL RADIOGRAPHIC OUTLINE
620-0007-51
135543 E
RECD-MPG
MAR 3 1971


NOTE
FOR FIELD MODIFICATIONS TO THE FLOW STABILIZERS SEE DRAWING 83309 A
FLANGE TO BE FABRICATED IN 4-90° SEGMENTS & WELDED PER VIEW C-C.
SEE DET B (1E)
(48)-3 5/8 DIA HOLES EQUALLY SPACED @ 7°-30' ON 167 1/2 DIA. BC STRADDLE AXES
(48)-3 5/8 DIA. HOLES EQUALLY SPACED @ 7°-30' ON 187 1/2 DIA. B.C. STRADDLE AXES
(12) 9 1/4 DIA HOLES EQUALLY SPACED @ 30° ON AXES
(12) 2 DIA HOLES EQUALLY SPACED @ 30° STRADDLE AXES.
SECTION A-A (5I) SCALE - 1/2 - 12
VIEW C-C (4B) SCALE: NONE
DET - B (3B) SCALE NONE
PLAN VIEW SCALE - 1/2 - 12
SECT H-H (3H) SCALE - N.T.S.
DET-G (6H)
125 MIN. THK. 3/16 NOM SST CLADDING
MARKING ON "W" AXIS SEE NOTE 8
BACKING RING SEE DET. F (6I) REMOVE AFTER WELDING
1 1/2 x 1/4 x 45 x 10 3/16 DEV. LG. BACKING RING REMOVE AFTER WELDING
2 DIA HOLES (REF)
DETAIL D (5E) SCALE - 3=12
DETAIL G
MK-71 FLOW STABILIZER 12 REQ'D SCALE: 1 1/2 = 12"
DETAIL E (6-9) SCALE - 3=12
3/8 EXCESS FOR MACHINING PRIOR TO WELDING TO MK. 37.
1/4" EXCESS REF FOR FINAL MACHINING
VESSEL SUPPORT FLANGE SEGMENTS SCALE - NONE
ELEVATION SECTION SCALE - 1/2 - 12
FLOW STABILIZER ROTATED FOR CLARITY
FOR ASSY & DET OF INST. NOZZLES SEE DWG 135545 E.
(4) 2" DIA HOLES EQ SPACED STRADDLE AXES
SEE DETAIL E (6-7)
SEE DET-D (7F)
DETAIL F (6E)

MK. NO	R	S	REQD
39	10'-11 13/16	12'-5	3
78	10'-11 9/16	12'-5 1/4	3

REVISIONS

SYM	DESCRIPTION	DATE	APPROVAL	
1	CHANGED DESIGN OF MK-71. MOVED DET. G FROM (11-C) TO (7-H). MOVED SECT. J-J TO (5-E). ADDED (48) 1" DIA. HOLES IN SECT. A-A & PLAN VIEW. IN (4-I) ADDED (4) 2" DIA HOLES. JMF/SGS	[illegible]	[illegible]	
2	[illegible] NOTE 2 DDP/[illegible]	[illegible]	[illegible]	
3	(1-B&C) 3'-1/16-0 WAS 3'. DETAIL D & DETAIL F ADDED MK-78. TWK/SGS	[illegible]	[illegible]	
4.	ADDED NOTE 8 & RELATIVE MARKING LOCATIONS IN ZONES (G-7/8)(C/E-8) DAK/SGS	[illegible]	BWH	
5.	(PLAN VIEW) CHANGED PICTURE OF FLOW STABILIZERS & ADDED W.P.~(SECT. H-H) ADDED [+ P 1" TOTAL] ~(ELEVATION VIEW) ADDED W.P., [-P-] SEE NOTE 9 & FLOW STABILIZER ROTATED FOR CLARITY~(DET D) 182 3/8" DIA (REF) WAS 182 7/8" DIA & ADDED 171 3/8" DIA (REF)~(NOTES) ADDED NOTE 9. KEC/JST	[illegible]	BWH	
6.	(4-10) ADDED FIELD MODIFICATION NOTE [illegible]/DEF	[illegible]	BWH	

NOTES

1. LIST OF DWGS 102968C
2. VESSEL IS DESIGNED, FABRICATED, INSPECTED & TESTED IN ACCORDANCE WITH:
   A) ASME BOILER & PRESSURE VESSEL CODE SECTION III 1965 EDITION
   B) ADDENDA & CODE CASE RULINGS IN EFFECT AT DATE OF ORDER
   C) EQUIPMENT SPEC. CS-3-22 LATEST REVISION
3. SYMBOL DESIGNATION:
   WR - WELD SPECIFICATION NO.
   MT - MAGNETIC PARTICLE INSPECTION
   PT - LIQUID PENETRANT INSPECTION
   RT - RADIOGRAPHIC INSPECTION
   UT - ULTRASONIC INSPECTION
   Δ - INDICATES AS ORDERED DIM.
4. ALL WELDING TO BE IN ACCORDANCE WITH INSTRUCTIONS FROM QUALITY CONTROL.
5. ALL MACHINED & CLAD SURFACES TO HAVE 250 FINISH UNLESS OTHERWISE NOTED.
6. CLADDING EDGE TO BE SUITABLE FOR SUBSEQUENT WELDING.
7. WELD PADS FOR INSULATION ATTACHMENT TO BE ADDED PER DWG 135558 E.
8. ALL PERMANENT IDENTIFICATION MARKINGS ARE TO BE APPLIED USING "INTERRUPTED-DOT" DIE STAMPS PER SECTION III ASME CODE, PARAGRAPH N-512. THE MARKINGS ARE TO BE INSPECTED AND, IF NECESSARY, RE-APPLIED AFTER EACH OPERATION AND AFTER FINAL STRESS RELIEF.
9. DATUM [-P-] IS DEFINED AS A PLANE, 30° OFF VERTICAL & PASSING THROUGH THE WORK POINT & THE SPHERICAL RADIUS.

Gilbert Associates, Inc. R. E. Vaughn 11/8/75

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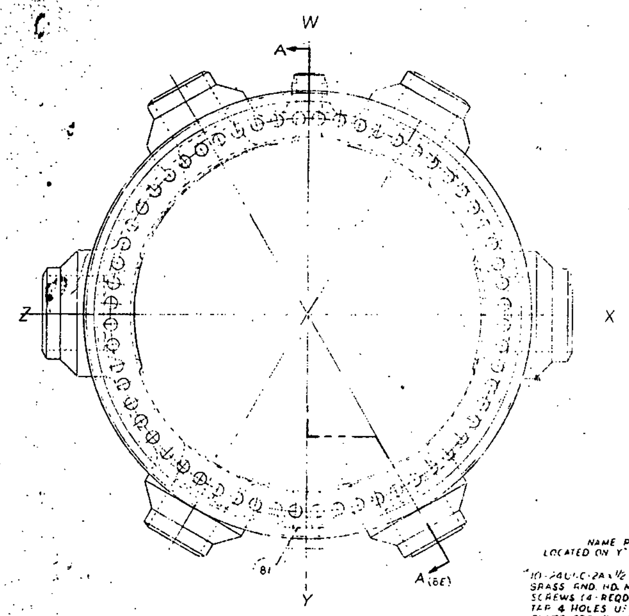
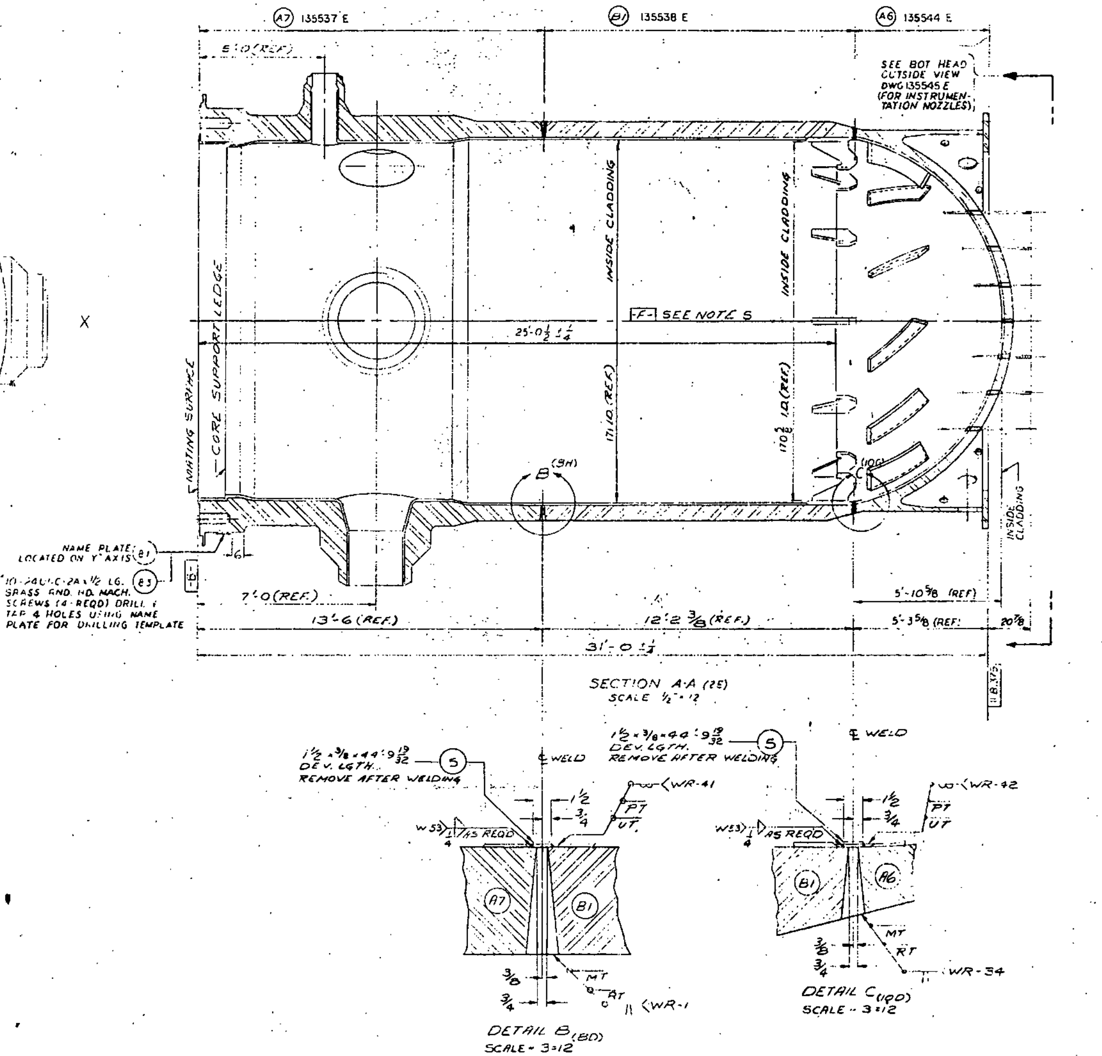
FLORIDA POWER CORP. CRYSTAL RIVER UNIT #3

VESSEL HD & SUPPT ASSY & DET

620-0007-51

135544E





NOTE
FOR FIELD MODIFICATIONS TO THE INSTRUMENTATION NOZZLES & FLOW STABILIZERS SEE DRAWINGS 109707 D, 154716 E & 83309 A

REVISIONS

REVISION NO.	DESCRIPTION	DATE	APPROVAL
1	DETAILS B/C MH6: 3/8 WAS 1/4 SLC/SGS	11/11/..	D.L.C.
2.	SECTION A-A REVISED SEAL LEDGE & DELETED BUTT WELD TERMINAL ON INSTRUMENTATION NOZZLE (11-E) 20 7/8 WAS 22 1/4. ADDED CUSTOMER'S NAME. TUK/SGS	3/20/..	C.L.R.
3.	(B-6) DELETED THERMAL SLEEVE. DAK/SGS	4/24/70	[signature]
4.	(C-10) CORRECTED PICTURE OF FLOW STABILIZERS. RLB/JST	4/14/71	[signature]
5.	(F-1) ADDED FIELD MODIFICATION NOTE GJ/DEF	11/1/72	[signature]

NOTES
1. LIST OF DWGS 102968 C.
2. FOR GENERAL NOTES SEE DWG 126951 E.
3. SYMBOL DESIGNATION
WR - WELD SPECIFICATION NO.
MT - MAGNETIC PARTICLE INSPECTION
PT - LIQUID PENETRANT INSPECTION
RT - RADIOGRAPHIC INSPECTION
UT - ULTRASONIC INSPECTION
4. ALL WELDING TO BE IN ACCORDANCE WITH INSTRUCTIONS FROM QUALITY CONTROL.
5. ℄ -F- IS ESTABLISHED IN NOTE 7 ON DWG. 135537 E.

GILBERT ASSOCIATES INC.
R. E. Vaughn
10/8/75
FLORIDA POWER CORP.
CRYSTAL RIVER PLANT UNIT 3
10 75 4203

FILE COPY

TOLERANCES UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE FOR PART TEMPERATURE OF 68° F

	UP TO 6" INCL.	OVER 6" TO 12" INCL.	OVER 12" TO 24" INCL.	OVER 24" TO 6'-0" INCL.	OVER 6'-0" TO 14'-0" INCL.	OVER 14'-0"
DECIMAL DIM.	±.003"	±.005"	±.005"	±.010"	±.031"	—
FRAC. DIM. MACH.	±1/64"	±1/32"	±1/32"	±1/16"	±1/16"	±1/8"
FRAC. DIM. UNMACH.	±1/16"	±1/16"	±3/32"	±1/8"	±3/16"	±3/16"
DIM. FOR BURNING	±1/8"	±1/8"	±1/8"	±1/8"	±3/16"	±3/16"

MACHINED SURFACES	FLATNESS	.001" PER INCH OF SURFACE UP TO .030" MAX.	
	PERPENDICULARITY	.003" PER INCH OF SURFACE UP TO .030" MAX.	BREAK CORNERS 1/64 X 45° OR CHAMFER
	CONCENTRICITY	.015/ TIR	
	ANGULARITY	±0°-30'	CHAMFERS ±5°
ROLLED OR WELDED SHELL	NON-CIRCULARITY	A.S.M.E. CODE TOLERANCE	
	TRAVEL	UP TO 42" DIA. INCL. ±3/16"	OVER 42" DIA. ±3/8"
	STRAIGHTNESS	1/4" PER 20 FEET OF LENGTH	

ALL MACHINED SURFACES TO HAVE 250/RMS FINISH UNLESS OTHERWISE NOTED

DWN. BY R. E. OWENS
CHKD. BY [signature]
PASSED BY C. E. B[...]
APPVD. BY R. J. B[...]
STD. SPL. DATE 6-17-68
620-0007-51 & 52
DO NOT SCALE - USE DIMENSIONS ONLY

FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT # 3

VESSEL ASSY & FINAL MACHINING

SCALE NOTED

THE BABCOCK & WILCOX COMPANY

135546 E

M000635

ENCLOSURE 3

ATTACHMENT B

COVERAGE DATA

INSERVICE INSPECTION
RELIEF REQUEST #09-003-II
THIRD TEN-YEAR ISI INTERVAL

Coverage Layout & Calculations

Weld Description: Lower Shell to Lower Head **ASME Code Item No.:** B1.11
CR-3 Weld ID: B1.2.1 **ASME Code Figure No.:** IWB-2500-1
TWS Weld Designator: W09 **AREVA Drawing No.:** 8019749

AGGREGATE COVERAGE: 46.0%

Zone Coverage Obtained

Inner 15%T: 40.6% **Outer 85%T:** 51.4%

Examination Volume Definition

Weld Length: 535.25 in.

Area Measurement		Volume Calculation	
Inner 15%T	7.84 sq. in.	Inner 15%T	4196.4 cu. in.
Outer 85%T	41.68 sq. in.	Outer 85%T	22309.2 cu. in.

Limitations	Limits scan by:	Compensation(s)
Lugs & Flow Stabilizers	Preventing full movement of Head	Breaking circ scan into 12 multiple regions to maximize scan coverage

Examination Coverage Calculations (*CW & CCW Treated as Single Sided Examination*)

INNER 15%T "UPPER" (LIMITATIONS)

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	70L/45L	Up	7.84	54.96	430.9	4196.4	10.3%	Yes	Lugs & Flow Stabilizers
2	70L/45L	Down	7.84	54.96	430.9	4196.4	10.3%	Yes	Lugs & Flow Stabilizers
3 & 4	70L/45L	CW & CCW	7.84	97.20	762.0	4196.4	18.2%	Yes	Lugs & Flow Stabilizers
				Totals:	***1623.8***	***12589.1***	**12.9%**		

OUTER 85%T "UPPER" (LIMITATIONS)

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	45L/45S	Up	41.68	54.96	2290.7	22309.2	10.3%	Yes	Lugs & Flow Stabilizers
2	45L/45S	Down	41.68	54.96	2290.7	22309.2	10.3%	Yes	Lugs & Flow Stabilizers
3 & 4	45L/45S	CW & CCW	41.68	160.32	6682.1	22309.2	30.0%	Yes	Lugs & Flow Stabilizers
				Totals:	***11263.6***	***66927.7***	**16.8%**		

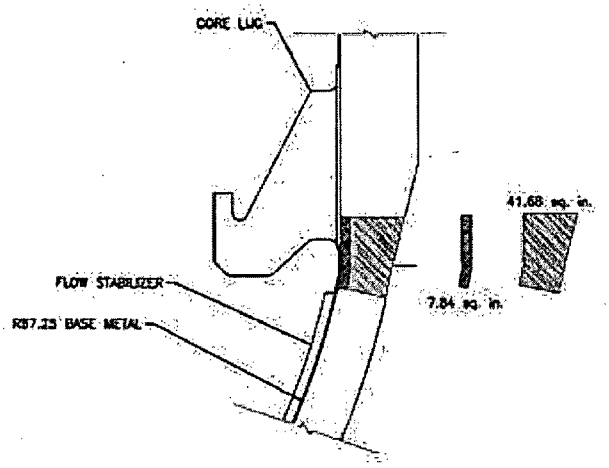
Examination Coverage Calculations (*All Treated as Single Sided Examination*)

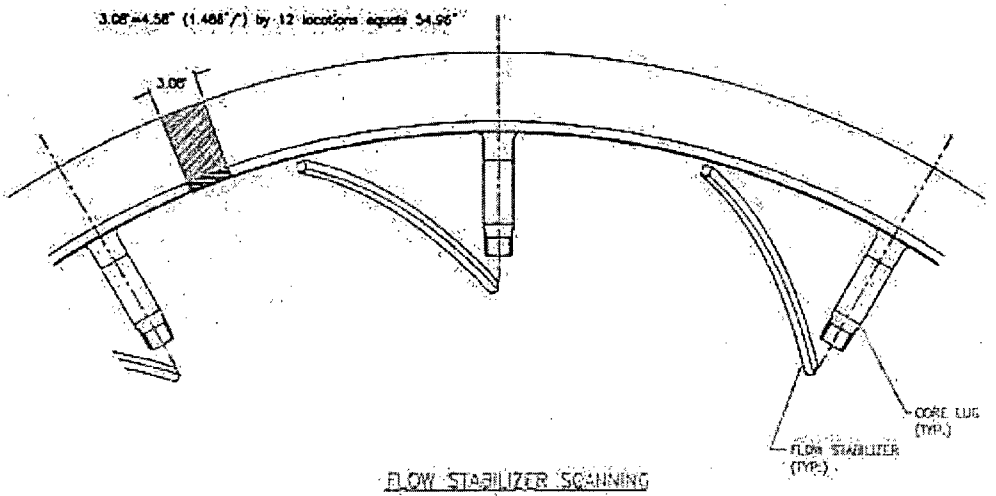
INNER 15%T "LOWER" (LIMITATIONS)

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1 & 2	70L/45L	Up & Down	4.09	301.00	1231.1	4196.4	29.3%	Yes	Lugs & Flow Stabilizers
3 & 4	70L/45L	CW & CCW	4.33	252.84	1094.8	4196.4	26.1%	Yes	Lugs & Flow Stabilizers
				Totals:	***2325.9***	***8392.7***	**27.7%**		

OUTER 85%T "LOWER" (LIMITATIONS)

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1 & 2	45L/45S	Up & Down	27.72	301.00	8343.7	22309.2	37.4%	Yes	Lugs & Flow Stabilizers
3 & 4	45L/45S	CW & CCW	22.66	312.00	7069.9	22309.2	31.7%	Yes	Lugs & Flow Stabilizers
				Totals:	***15413.6***	***44618.4***	**34.5%**		

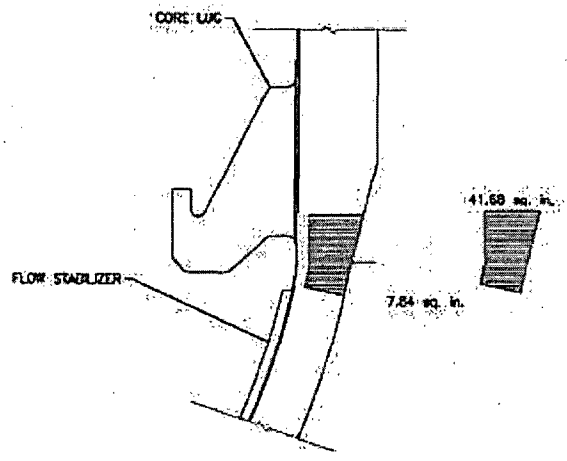


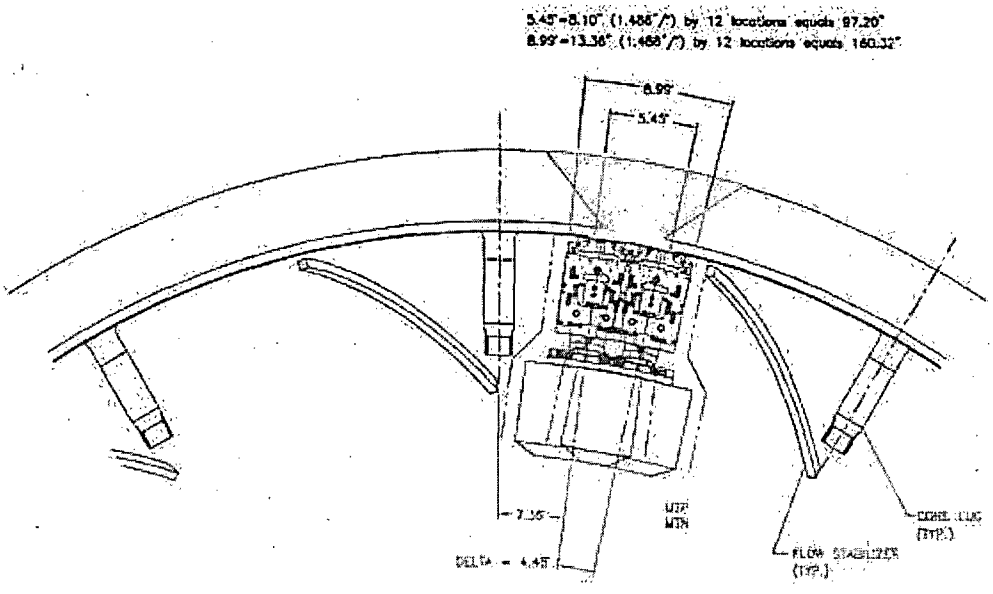


FLOW STABILIZER SCANNING

15% & 85%T Coverage Plot "Limited" Lower Scan in Axial "Z" Direction - Limited in Circumferential "e" Direction
"MAP" Scan Not Possible Due to Tool Cable Bundle/Lug Interference
(Axial Scan – Perpendicular to weld)

Weld Identification
TWS No.: W09
CR-3 No.: B1.21



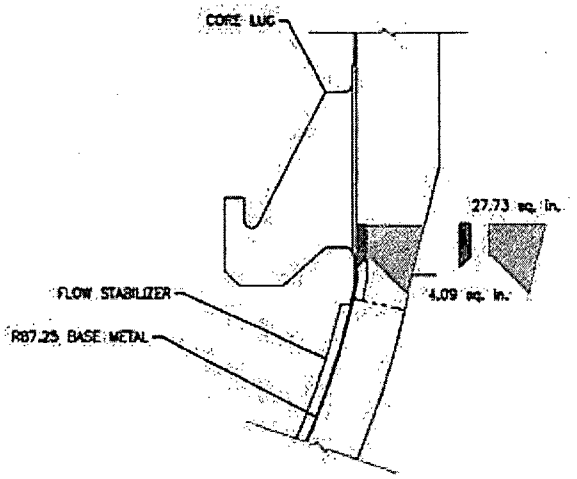


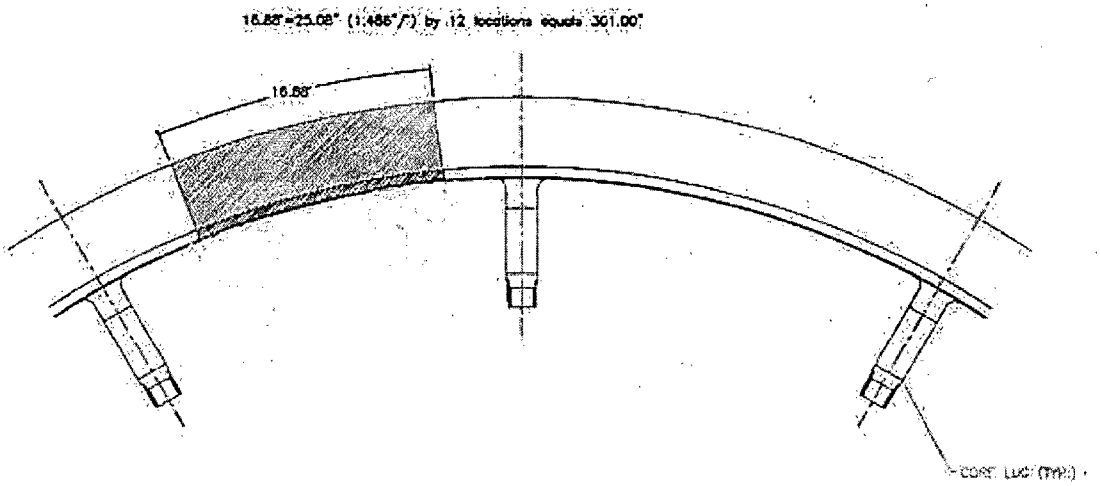
FLOW STABILIZER SCANNING

Weld Identification
TWS No.: W09
CR-3 No.: B1.2.1

15% & 85%T Coverage Plot "Limited" Lower Scan in Axial "Z" Direction - Limited in Circumferential "e" Direction
(Circ Scan – Parallel to weld)

Note: The circumferential extent of the MTP & MTN scans are derived by the average distance traveled by the respective (i.e., 45° or 70°) beam path. This is shown by the measurements taken from the midpoint of the beam paths.

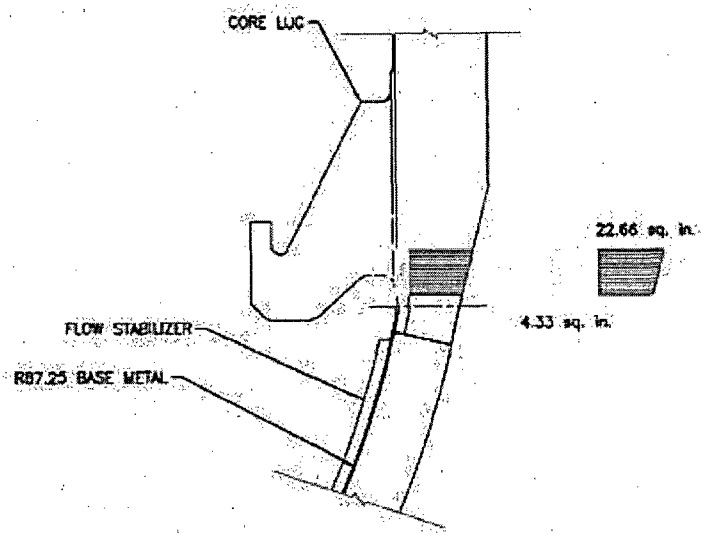


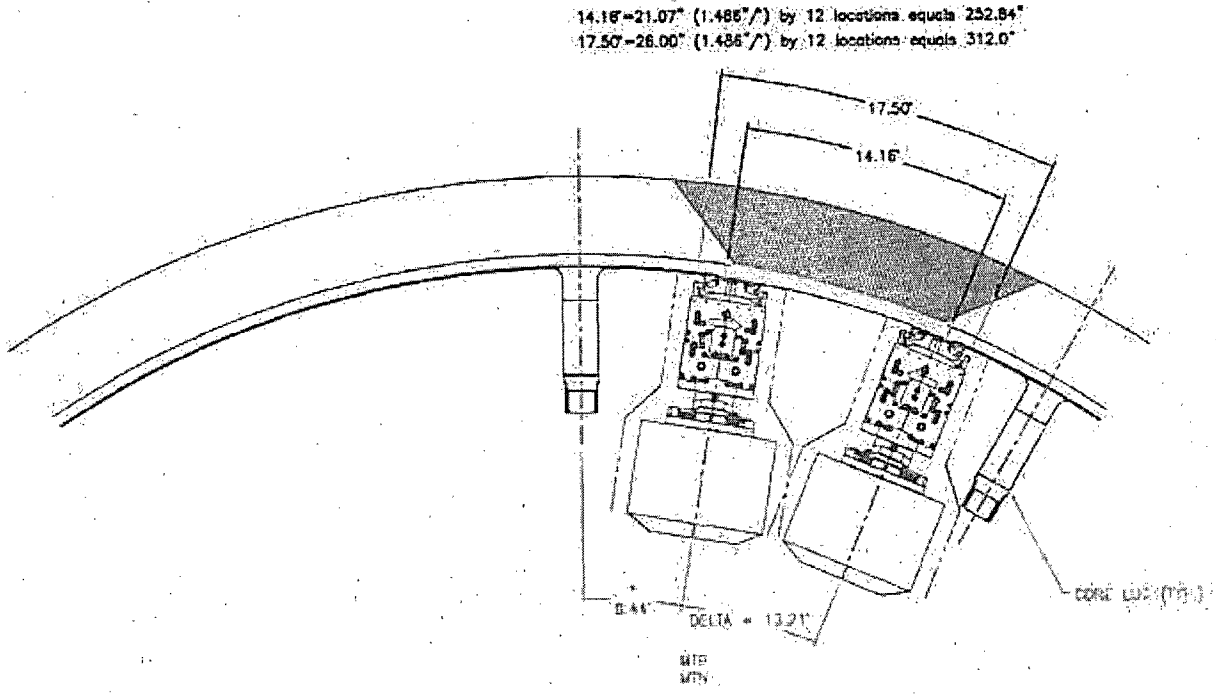


CORE LUG SCANNING

Weld Identification
TWS No.: W09
CR-3 No.: B1.2.1

15% & 85%T Coverage Plot "Unlimited" Upper Scan in both Axial "Z" and Circumferential "e" Directions
(Axial Scan – Perpendicular to weld)





CORE LUG SCANNING

Weld Identification
TWS No.: W09
CR-3 No.: B1.2.1

15% & 85%T Coverage Plot "Unlimited" Upper Scan in both Axial "Z" and Circumferential "e" Direction
(Circ Scan – Parallel to weld)

Note: The circumferential extent of the MTP & MTN scans are derived by the average distance traveled by the respective (i.e., 45° or 70°) beam path. This is shown by the measurements taken from the midpoint of the beam paths.

Coverage Layout & Calculations

Weld Description: Nozzle Belt to Upper Shell **ASME Code Item No.:** B1.11
CR-3 Weld ID: B1.2.3 **ASME Code Figure No.:** IWB-2500-1
TWS Weld Designator: W02 **AREVA Drawing No.:** 8019749

AGGREGATE COVERAGE: 90.0%

Zone Coverage Obtained			
Inner 15%T:	85.4%	Outer 85%T:	94.7%

Examination Volume Definition			
Weld Length:	275.08 in.		
Area Measurement		**Volume Calculation**	
Inner 15%T	See Notes sq. in.	Inner 15%T	7194.5 cu. in.
Outer 85%T	See Notes sq. in.	Outer 85%T	43643.6 cu. in.

Limitations	Limits scan by:	Compensation(s)
Nozzles	Reduction in circ scan distance	None

Examination Coverage Calculations (*Treated as Single Sided Examination*)

INNER 15%T

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	*Limited*	*Limitations*
1 & 2	70L/45L	Up & Down	See Notes		6244.2	7194.5	86.8%	Yes	Nozzles
3	70L/45L	CW	See Notes		6090.9	7194.5	84.7%	Yes	Nozzles
4	70L/45L	CCW	See Notes		6090.9	7194.5	84.7%	Yes	Nozzles
				Totals:	*6090.9*	*7194.5*	*85.4%*		

OUTER 85%T

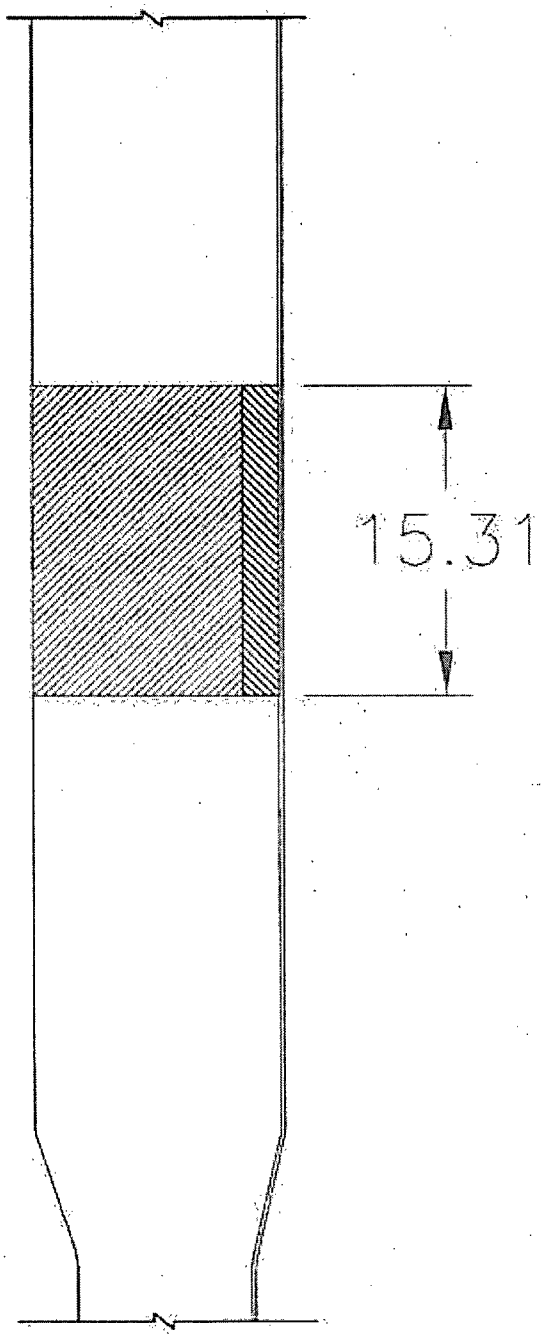
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	*Limited*	*Limitations*
1 & 2	45L/45S	Up & Down	See Notes		37785.4	43643.6	86.6%	Yes	Nozzles
3	45L/45S	CW	See Notes		43072.7	43643.6	98.7%	Yes	Nozzles
4	45L/45S	CCW	See Notes		43072.7	43643.6	98.7%	Yes	Nozzles
				Totals:	*37785.4*	*43643.6*	*94.7%*		

Support Charts for Area Examined:

		Total Area to be Examined			
	Vertical	Horizontal Area		Total Volume	
Scan Area	Height	15%	85%	15%	85%
Z-W & W-X	15.31	86.98	527.62	1331.66	8077.86
OUT Z & Z-W	15.31	74.39	451.27	1138.91	6908.94
Y-Z & OUT Z	15.31	73.59	446.44	1126.66	6835.00
X-Y & Y-Z	15.31	86.98	527.62	1331.66	8077.86
OUT X & X-Y	15.31	73.59	446.44	1126.66	6835.00
W-X & OUT X	15.31	74.39	451.27	1138.91	6908.94
			Total	*7194.5*	*43643.6*

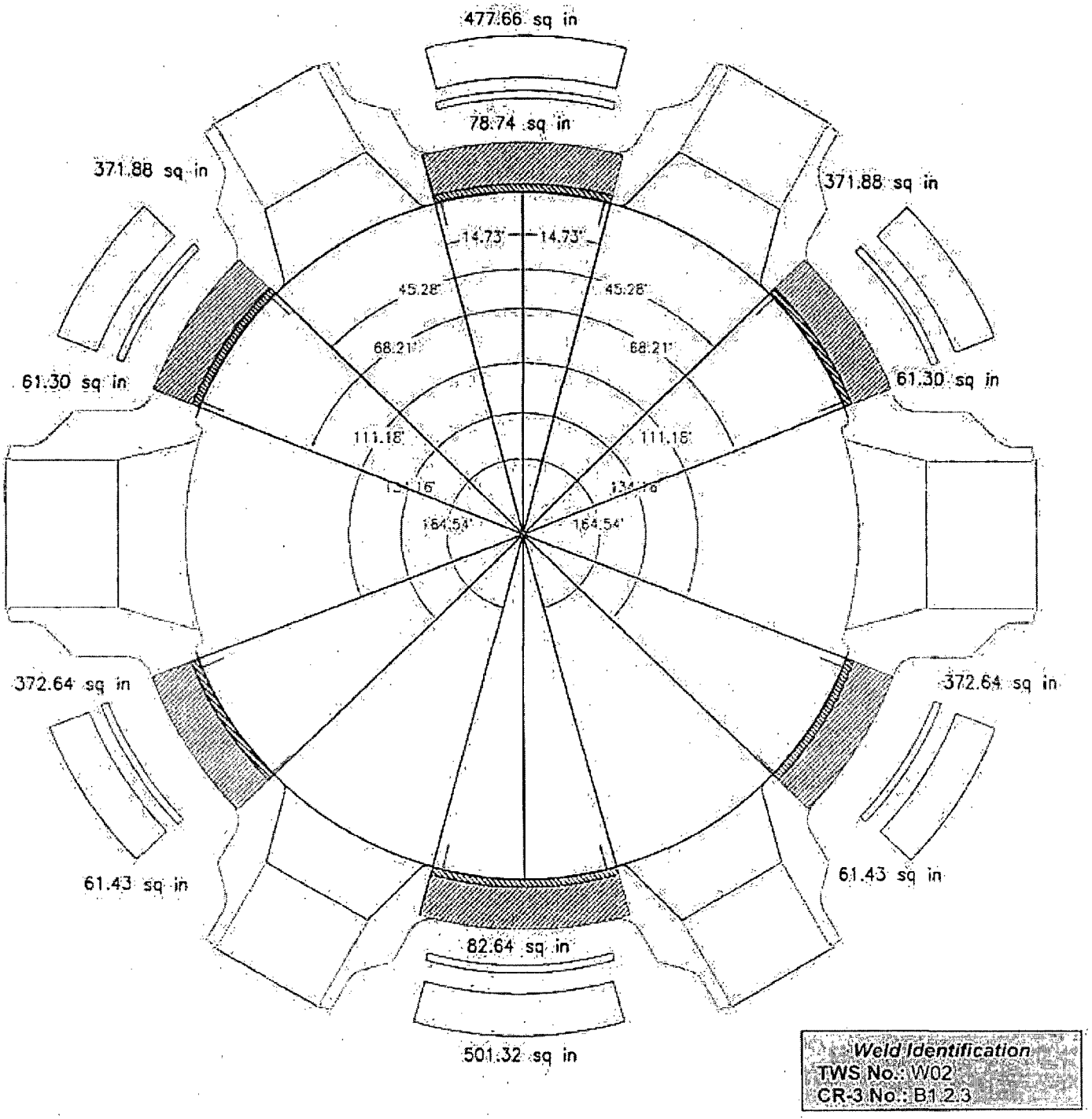
		STP & STN			
	Vertical	Horizontal Area		Total Volume	
Scan Area	Height	15%	85%	15%	85%
Z-W & W-X	15.31	77.76	524.67	1190.51	8032.70
OUT Z & Z-W	15.31	60.58	440.12	927.48	6738.24
Y-Z & OUT Z	15.31	60.58	434.30	927.48	6649.13
X-Y & Y-Z	15.31	77.76	539.85	1190.51	8265.10
OUT X & X-Y	15.31	60.58	434.32	927.48	6649.44
W-X & OUT X	15.31	60.58	440.11	927.48	6738.08
			Total	*6090.9*	*43072.7*

		SZP & SZN			
	Vertical	Horizontal Area		Total Volume	
Scan Area	Height	15%	85%	15%	85%
Z-W & W-X	15.31	78.75	477.66	1205.66	7312.97
OUT Z & Z-W	15.31	61.30	371.88	938.50	5693.48
Y-Z & OUT Z	15.31	61.43	372.64	940.49	5705.12
X-Y & Y-Z	15.31	83.64	501.32	1280.53	7675.21
OUT X & X-Y	15.31	61.43	372.64	940.49	5705.12
W-X & OUT X	15.31	61.30	371.88	938.50	5693.48
			Total	*6244.2*	*37785.4*



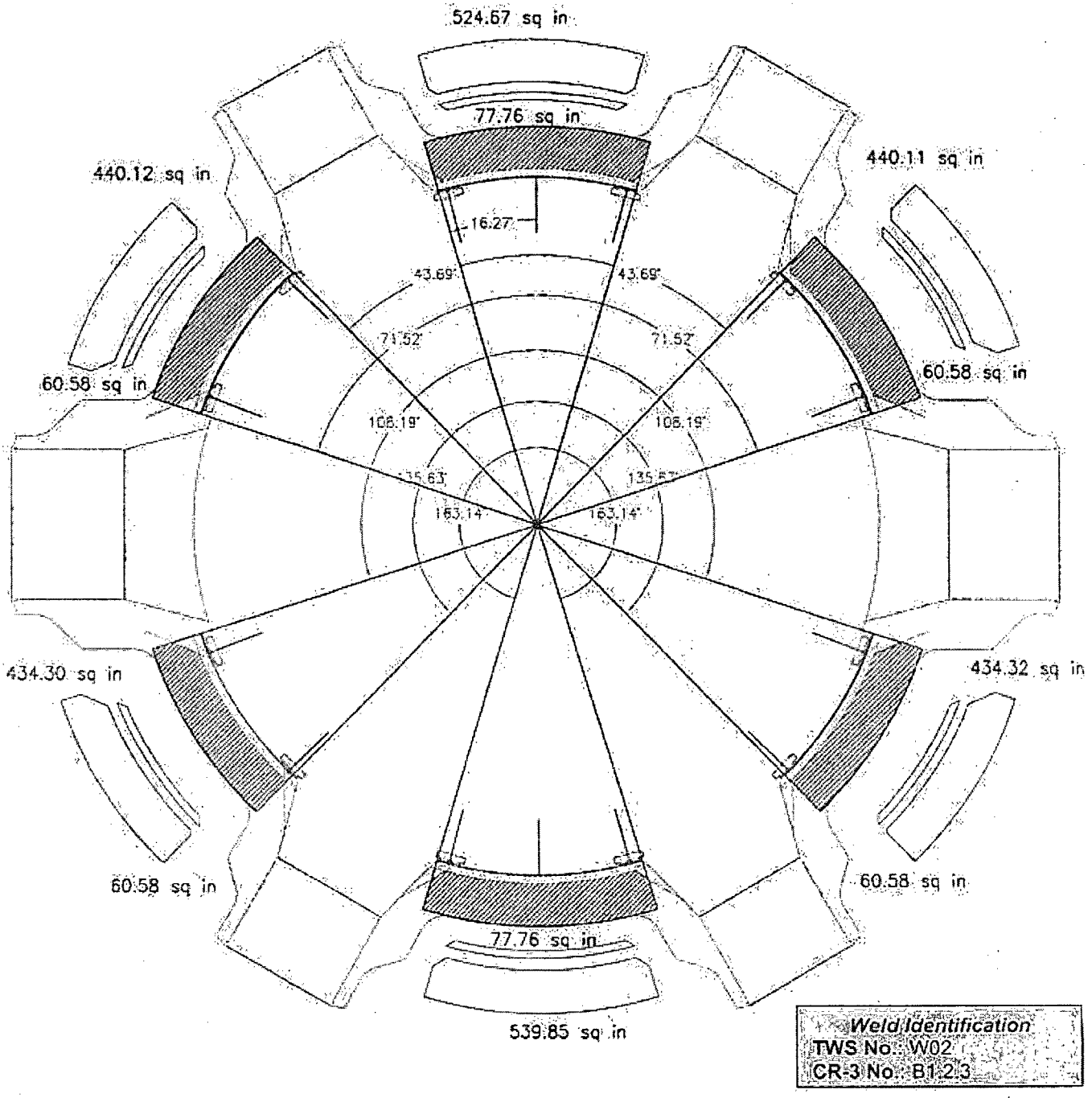
Weld Identification
TWS No.: W02
CR-3 No.: B1.2.3

15% & 85%T Coverage Plot Typical Cross Section (Both Scans Axial & Circ)



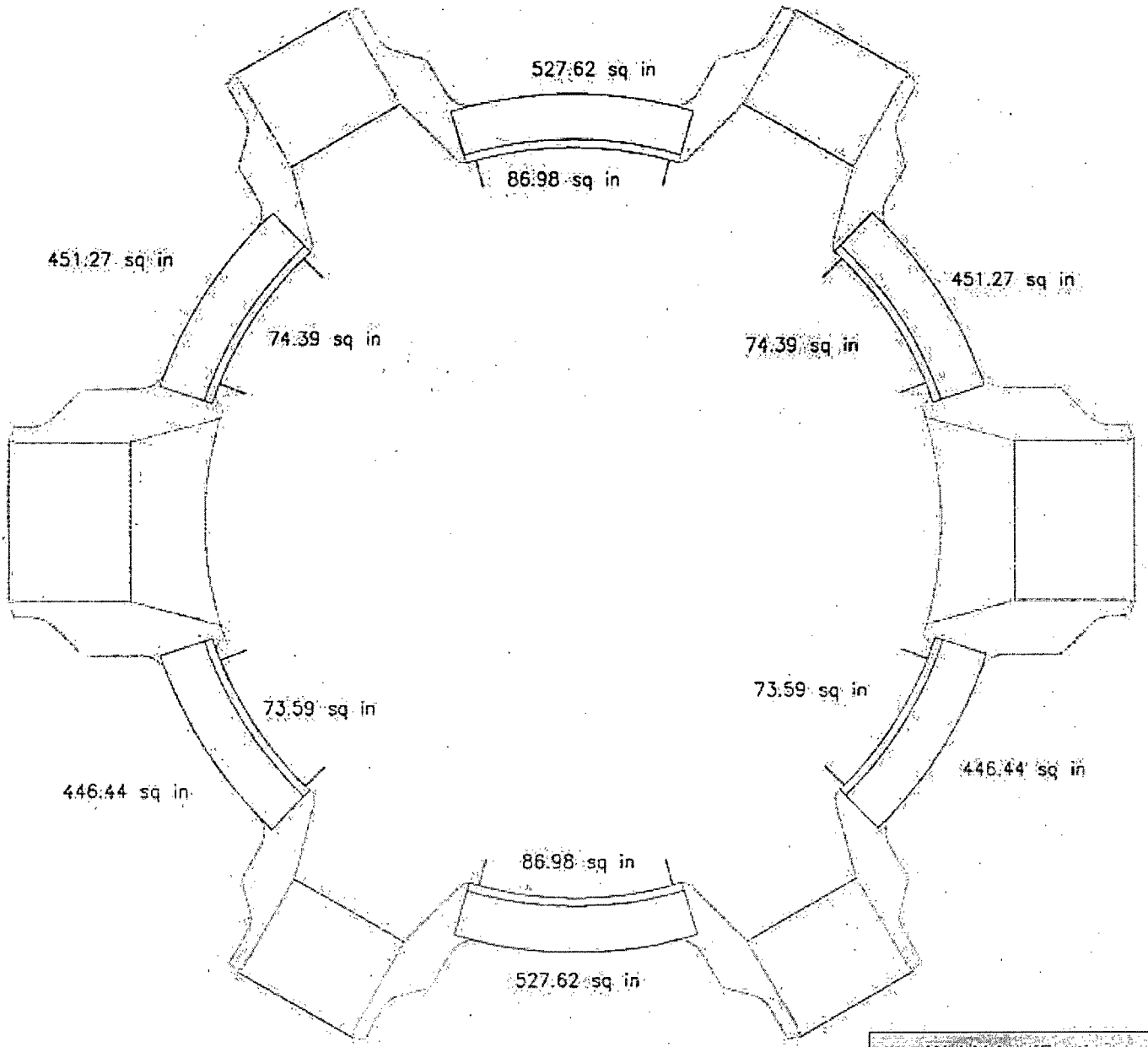
15% & 85%T Coverage Plot (Axial Scan – Perpendicular to weld)

View – Cross Section at Nozzle Centerline Elevation



15% & 85%T Coverage Plot (Circumferential Scan – Parallel to weld)

View – Cross Section at Nozzle Centerline Elevation



15% & 85%T Total Cross Sectional Area

View – Cross Section at Nozzle Centerline Elevation

Coverage Layout & Calculations

Weld Description: Long Seam Weld
CR-3 Weld ID: B1.1.5 & B1.1.6
TWS Weld Designator: W06 & W07

ASME Code Item No.: B1.12
ASME Code Figure No.: IWB-2500-2
AREVA Drawing No.: 8019749

AGGREGATE COVERAGE: 88.1%

Zone Coverage Obtained

Inner 15%T: 87.2% Outer 85%T: 89.0%

Examination Volume Definition

Weld Length: 73.12 in.

Area Measurement		Volume Calculation	
Inner 15%T	12.73 sq. in.	Inner 15%T	930.8 cu. in.
Outer 85%T	75.65 sq. in.	Outer 85%T	5531.5 cu. in.

Limitations	Limits scan by:	Compensation(s)
Lugs & Flow Stabilizers	Preventing full movement of Head	Breaking circ.scan into multiple regions to maximize scan coverage

Examination Coverage Calculations (*Treated as Dual Sided Examination*)

INNER 15%T

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	70L/45L	Up	12.73	49.12	625.3	930.8	67.2%	Yes	Lugs & Flow Stabilizers
2	70L/45L	Down	12.73	49.12	625.3	930.8	67.2%	Yes	Lugs & Flow Stabilizers
3	70L/45L	CW	12.73	47.08	599.3	930.8	64.4%	Yes	Lugs & Flow Stabilizers
4	70L/45L	CCW	12.73	47.08	599.3	930.8	64.4%	Yes	Lugs & Flow Stabilizers
				Totals:	*2449.3*	*3723.3*	65.8%		

OUTER 85%T

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	45L/45S	Up	75.65	49.12	3715.9	5531.5	67.2%	Yes	Lugs & Flow Stabilizers
2	45L/45S	Down	75.65	49.12	3715.9	5531.5	67.2%	Yes	Lugs & Flow Stabilizers
3	45L/45S	CW	75.65	47.08	3561.6	5531.5	64.4%	Yes	Lugs & Flow Stabilizers
4	45L/45S	CCW	75.65	47.08	3561.6	5531.5	64.4%	Yes	Lugs & Flow Stabilizers
				Totals:	*14555.1*	*22126.1*	65.8%		

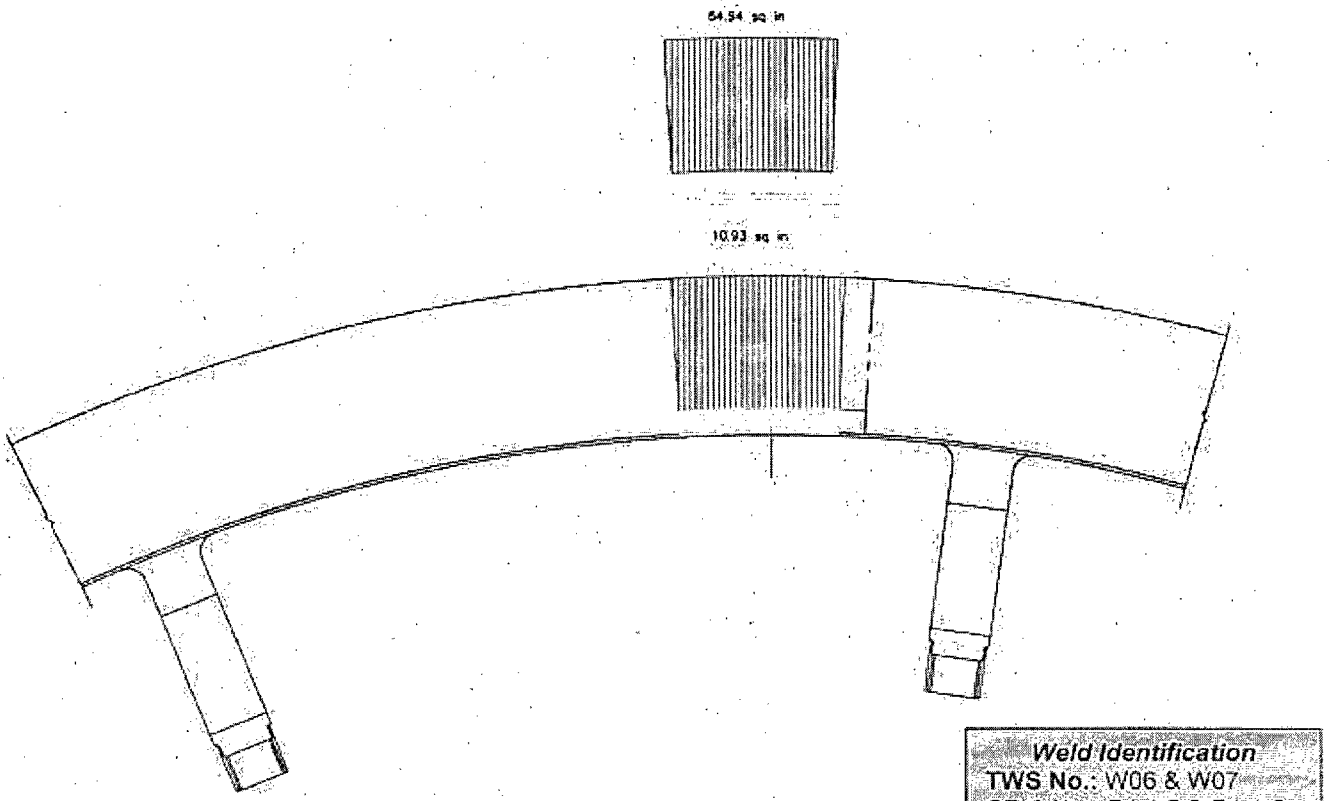
Examination Coverage Calculations (*CW & CCW Treated as Single Sided Examination*)

INNER 15%T (LIMITATIONS)

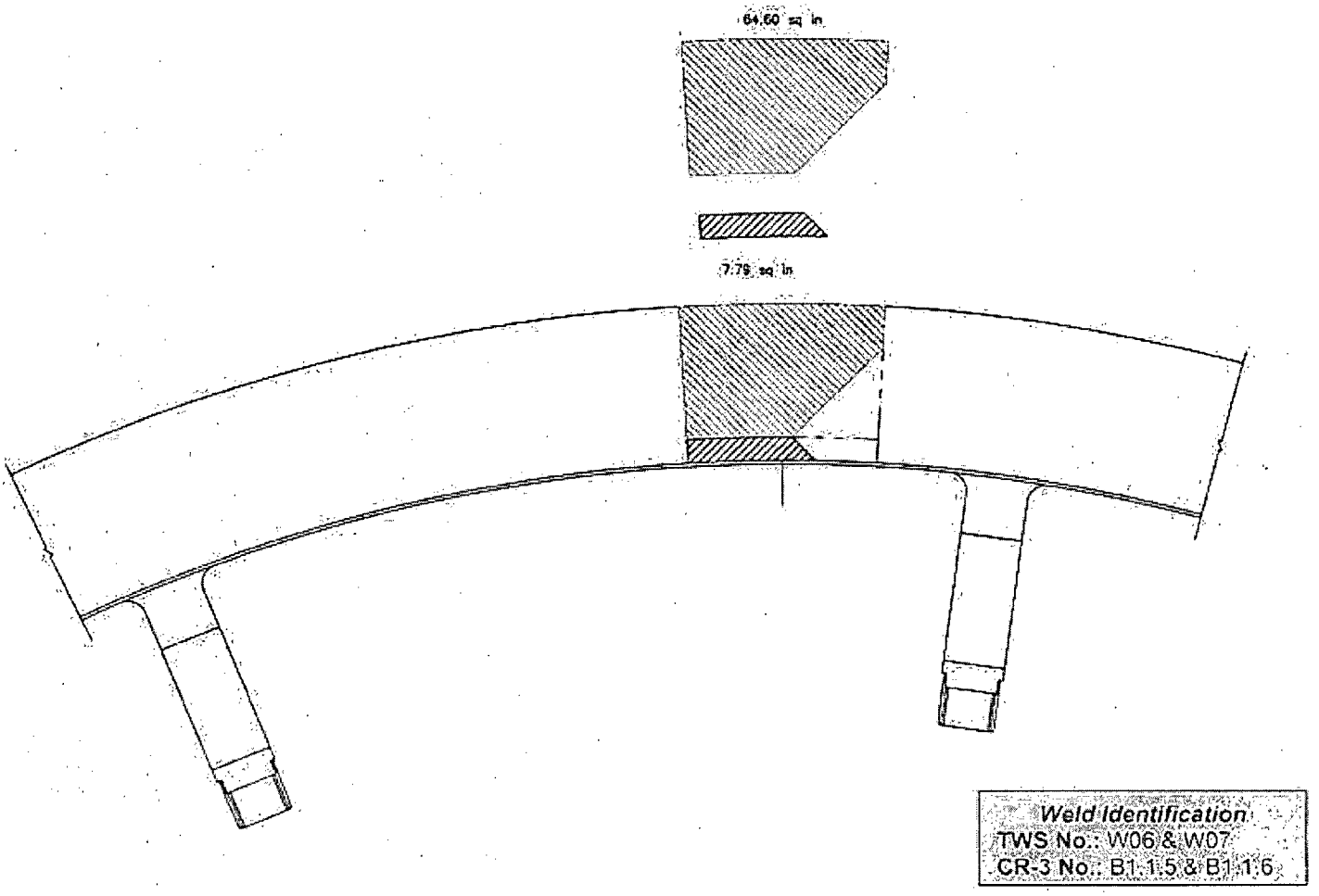
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	70L/45L	Up	10.93	21.69	237.1	930.8	25.5%	Yes	Lugs & Flow Stabilizers
2	70L/45L	Down	10.93	21.69	237.1	930.8	25.5%	Yes	Lugs & Flow Stabilizers
3 & 4	70L/45L	CW & CCW	7.79	16.05	125.0	930.8	13.4%	Yes	Lugs & Flow Stabilizers
				Totals:	*599.2*	*2792.5*	*21.5%*		

OUTER 85%T (LIMITATIONS)

Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	45L/45S	Up	64.94	21.69	1408.5	5531.5	25.5%	Yes	Lugs & Flow Stabilizers
2	45L/45S	Down	64.94	21.69	1408.5	5531.5	25.5%	Yes	Lugs & Flow Stabilizers
3 & 4	45L/45S	CW & CCW	64.60	16.05	1036.8	5531.5	18.7%	Yes	Lugs & Flow Stabilizers
				Totals:	*3853.9*	*16594.6*	*23.2%*		

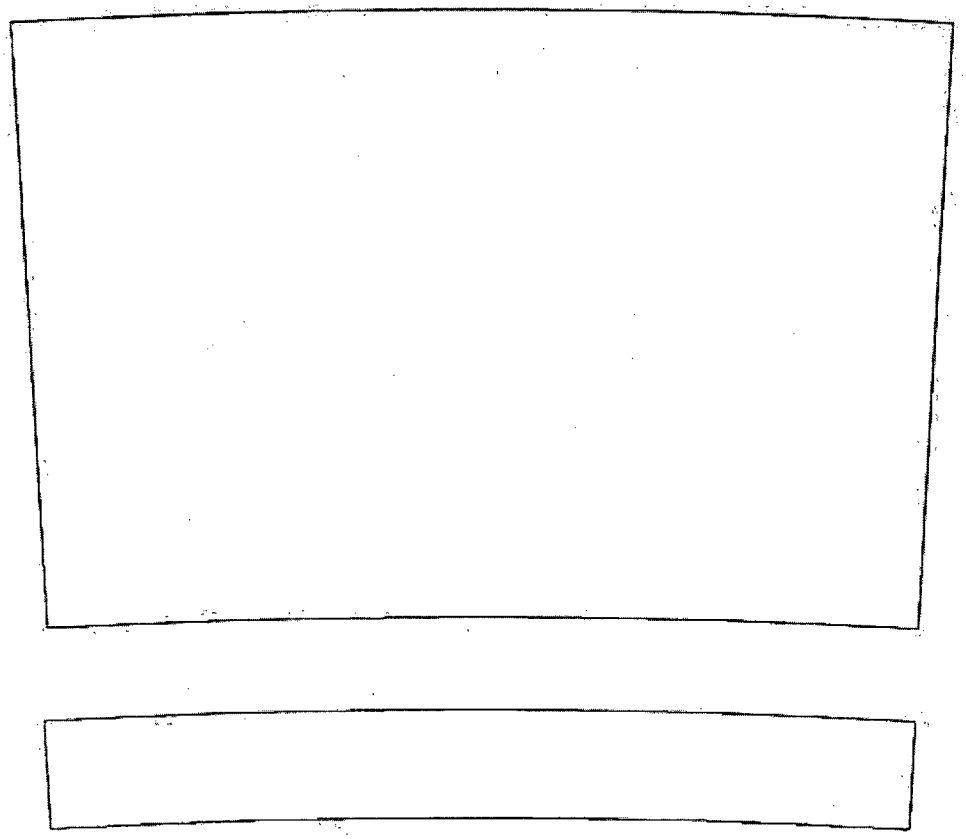


15% & 85%T Coverage Plot (Axial Scan – Parallel to weld)



15% & 85%T Coverage Plot (Circ Scan – Perpendicular to weld)

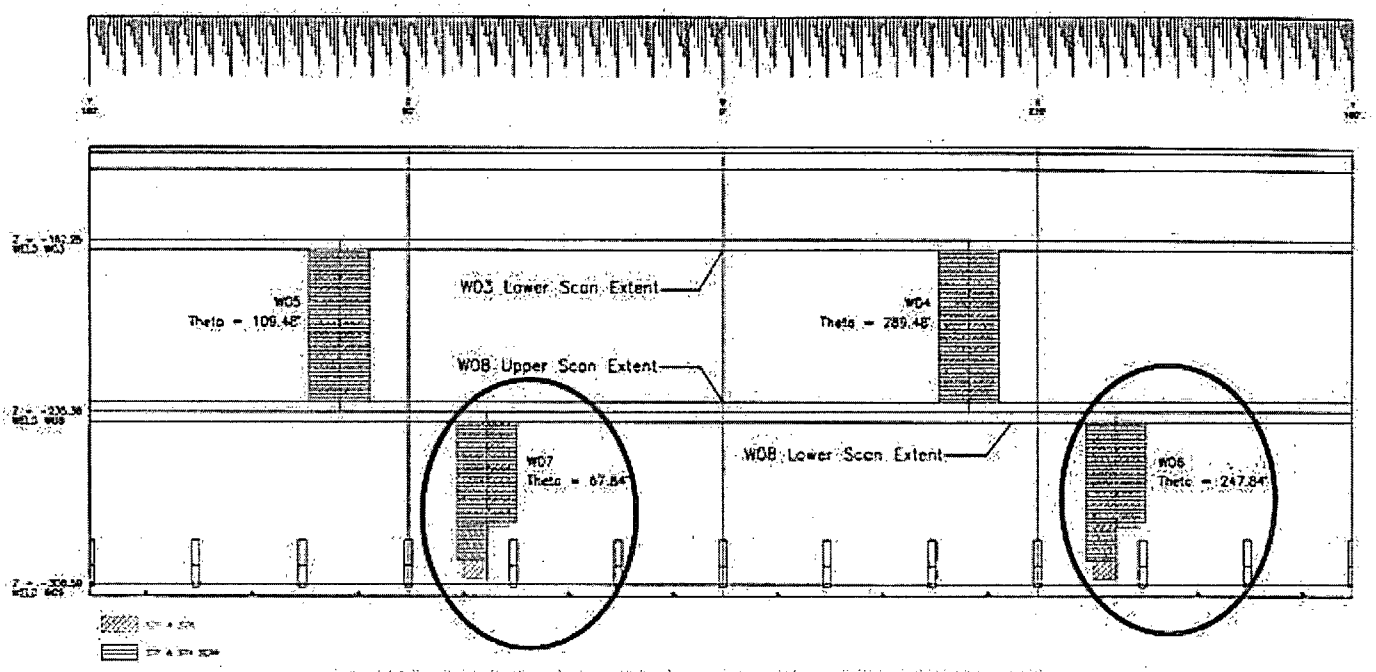
75.65 sq in



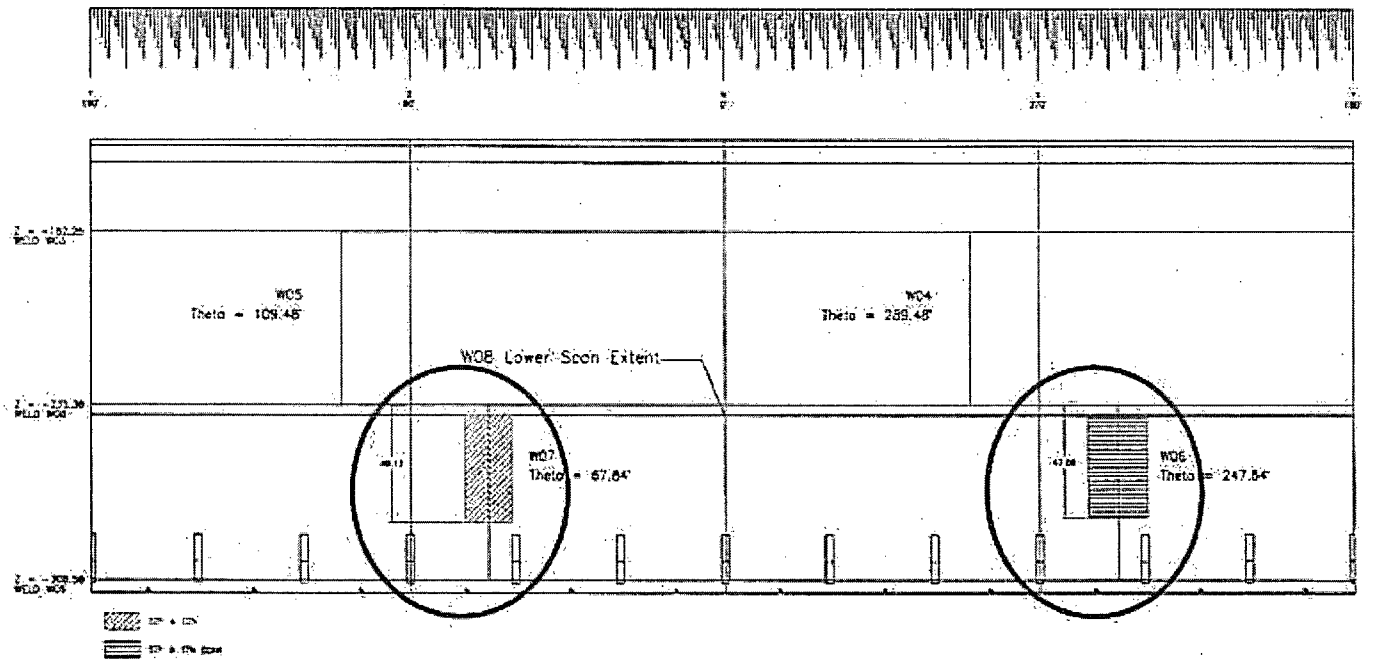
12.73 sq in

Weld Identification
TWS No.: W06 & W07
CR-3 No.: B1.1.5 & B1.1.6

15% & 85%T Total Cross Sectional Area

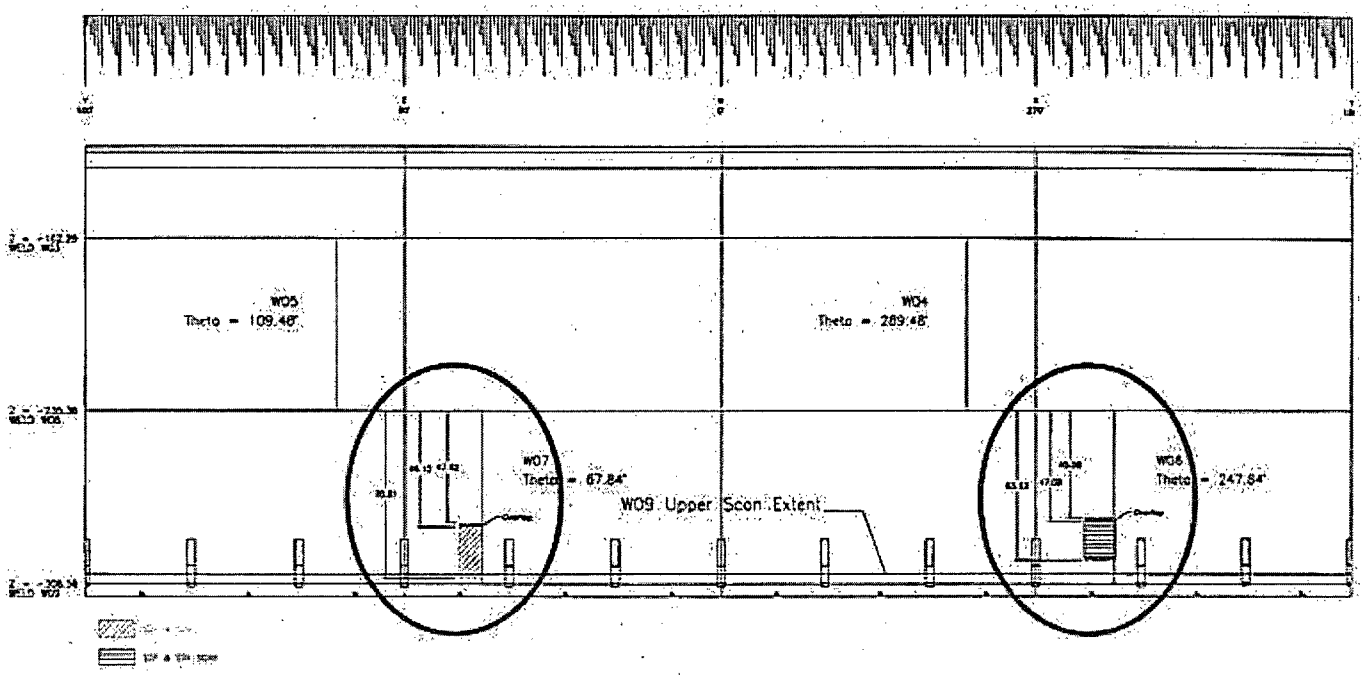


View from Vessel ID looking out All Scans (W06 & W07 circled)



View from Vessel ID looking out "Unlimited" Upper Scan Regions shown (W06 & W07 circled)

Weld Identification
TWS No.: W06 & W07
CR-3 No.: B1.1.5 & B1.1.6



View from Vessel ID looking out "Limited" Lower Scan Region (W06 & W07 circled)

Weld Identification
TWS No.: W06 & W07
CR-3 No.: B1.15 & B1.16

Coverage Layout & Calculations

Weld Description: Outlet Nozzle to Shell @ X axis & Z axis
ASME Code Item No.: B3.90 **ASME Code Figure No.:** IWB-2500-7
CR-3 Weld ID (TWS Weld Designator): B1.4.7A (W15) and B1.4.8A (W23)
AREVA Drawing No.: 8019749

AGGREGATE COVERAGE: 69.8%

Zone Coverage Obtained

Inner 15%T: 39.6% **Outer 85%T:** 100.0%

Examination Volume Definition

Area Measurement	Volume Calculation	
Area Measurement not calculated for nozzles.	Inner 15%T	1300.0 cu. in.
	Outer 85%T	12859.2 cu. in.

Limitations	Limits scan by:	Compensation(s)
Yes	Weld/scan surface geometry	

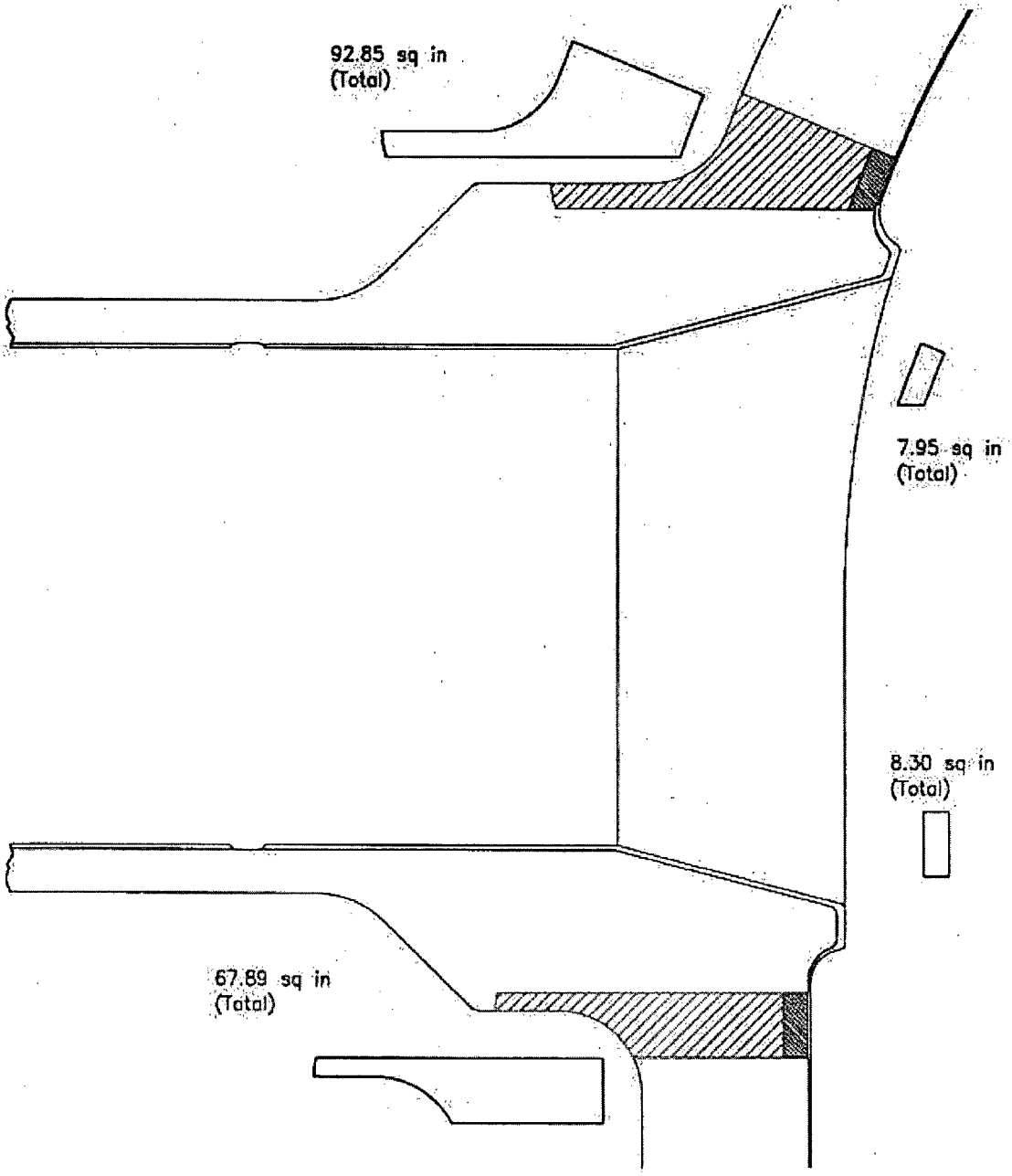
Examination Coverage Calculations (*Treated as Dual Sided Examination.*)

INNER 15%T

Entry #	Exam Angle (deg.)	Beam Direction	Length Examined (degs)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	70L/45L	Bore: Radial Out	360	1300.0	1300.0	100.0%	Yes	
2	70L/45L	RVID: Radial In	360	401.6	1300.0	30.9%	Yes	
3	70L/45L	CW	360	180.0	1300.0	13.8%	Yes	
4	70L/45L	CCW	360	180.0	1300.0	13.8%	Yes	
			Totals:	*2061.6*	*5200.0*	39.6%		

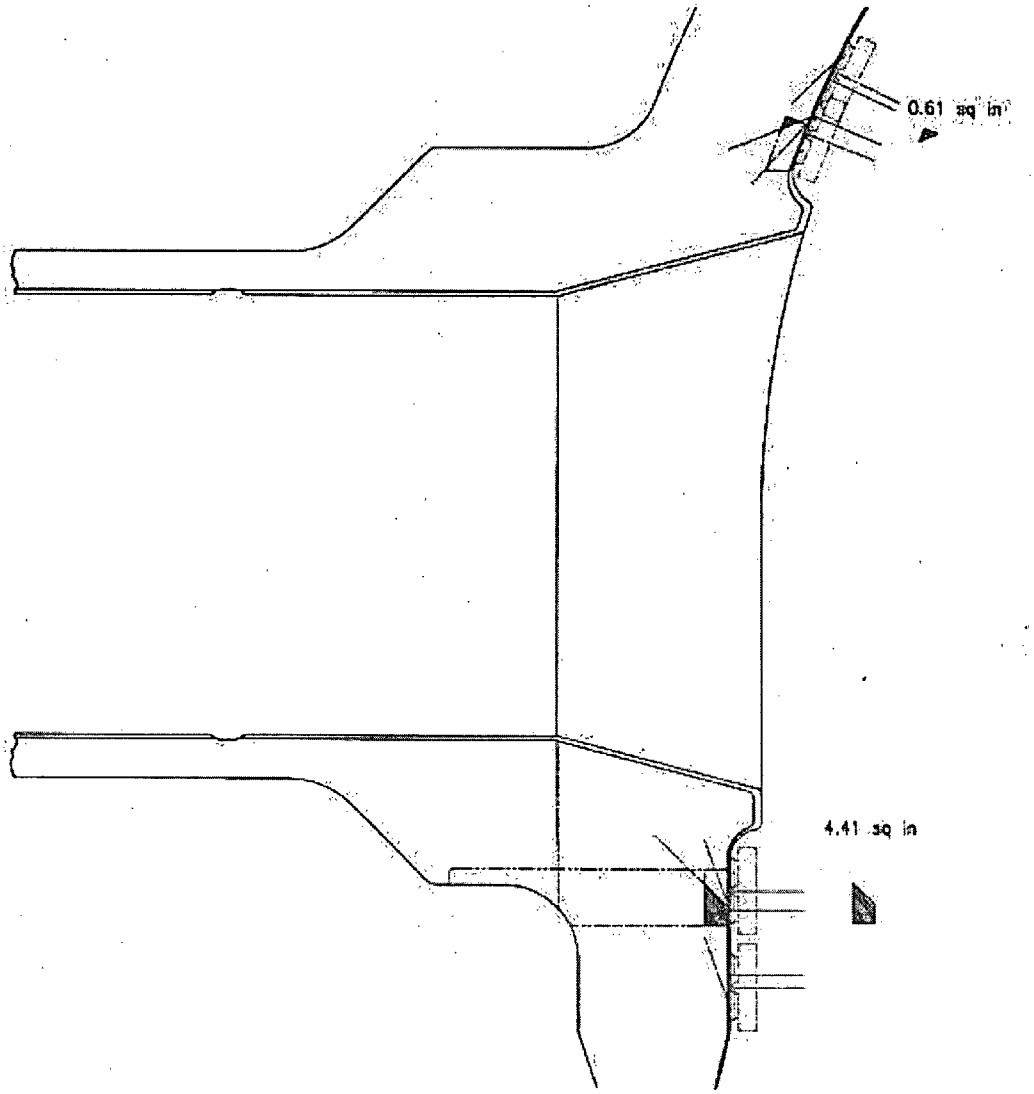
OUTER 85%T

Entry #	Exam Angle (deg.)	Beam Direction	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	15L/45S	Bore: Radial Out	360	12859.2	12859.2	100.0%	No	
			Totals:	*12859.2*	*12859.2*	100.0%		



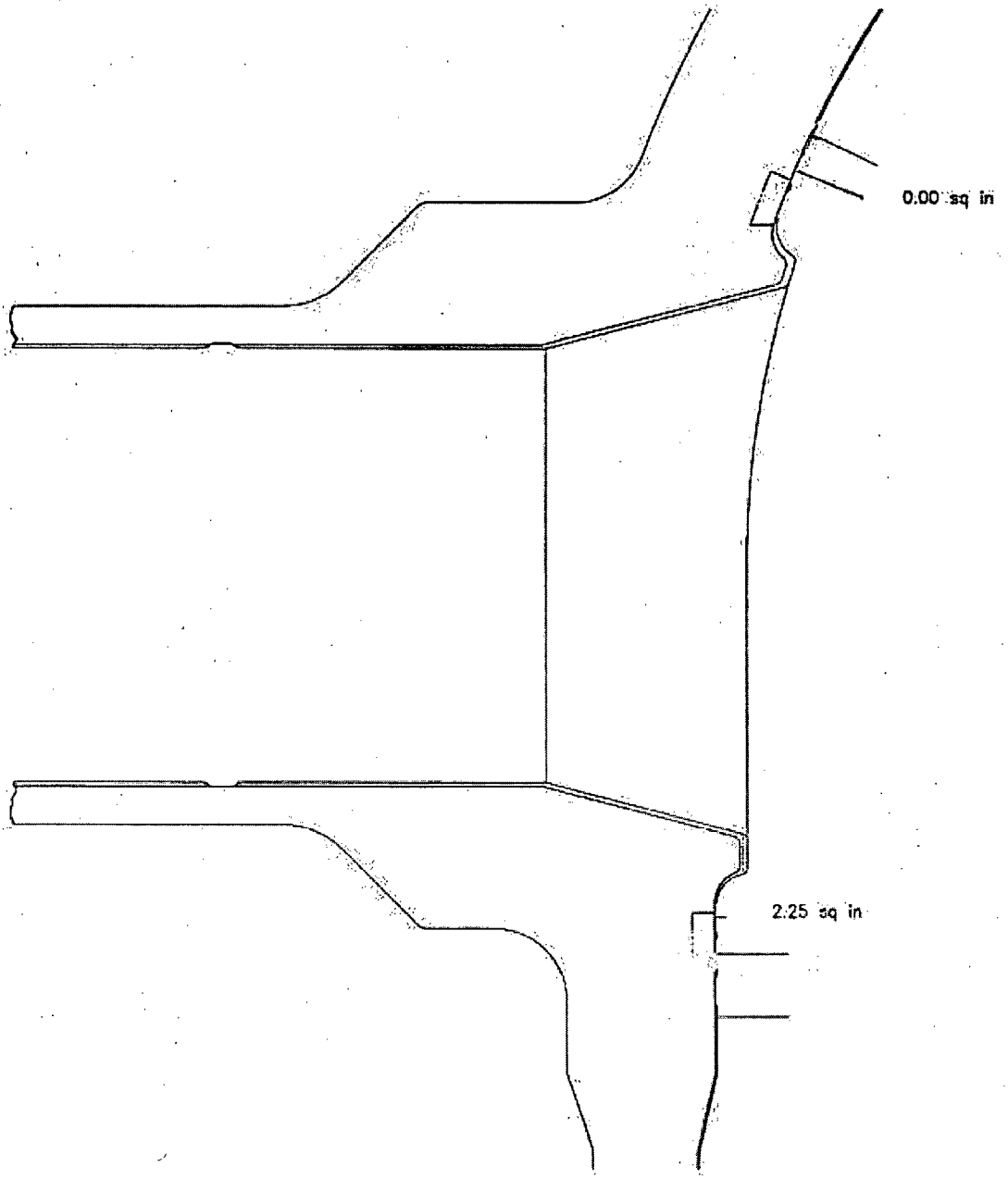
15% & 85%T Coverage Plot (Radial Scan – Perpendicular to weld from Nozzle Bore)

Weld Identification
CR3 No. (TWS No.): B1.4.7A (W15), B1.4.8A (W23)



15%T Coverage Plot (Radial Scan – Perpendicular to weld from Shell ID)
Beam Direction toward Bore ID

Weld Identification
CR3 No. (TWS No.): B1.4.7A (W15), B1.4.8A (W23)



15% T Coverage Plot (Circumferential Scan – Parallel to weld from Shell ID)

Weld Identification
CR3 No. (TWS No.): B1.4.7A (W15), B1.4.8A (W23)