Progress Energy

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

Ref: 10 CFR 50.55a

May 28, 2009
3F0509-08

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 Request #09-003-II, Revision 1 (TAC NO. ME0907)

Reference: CR-3 to NRC letter dated March 20, 2009, "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 Request #09-003-II, Revision 1, for Inservice Inspection Impracticality. Relief Request #09-003-II, Revision 0, was initially submitted pursuant to 10 CFR 50.55a(g)(6)(ii)(A)(5) and 10 CFR 50.55a(a)(3)(i), for Reactor Pressure Vessel Shell Weld Examinations. The purpose of this relief request is to seek approval for limited volumetric examinations performed on the ASME Code Class 1 Reactor Pressure Vessel Shell during the Crystal River Unit 3 (CR-3) Third Ten-Year Inservice Inspection (ISI) Interval. The 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. The examinations were limited due to geometry or by interferences with other plant components.

This submittal also corrects a reference contained in the Precedent Section of Relief Request #09-003-II, Revision 0. NRC letter dated August 5, 1999, (TAC NO. MA1642) was referenced instead of NRC letter dated October 1, 1999, (TAC NO. MA3314).

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,

R. W. Dreamann for S. J. CAHILL

Stephen J. Cahill
Manager, Engineering
Crystal River Nuclear Plant

SJC/dwh

Enclosure: Relief Request #09-003-II, Revision 1

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

INSERVICE INSPECTION
RELIEF REQUEST #09-003-II, REVISION 1
THIRD TEN-YEAR ISI INTERVAL

10 CFR 50.55a Request #09-003-II, Revision 1

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

--Inservice Inspection Impracticality--

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 October 1, 1999 (TAC NO. MA3314).

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

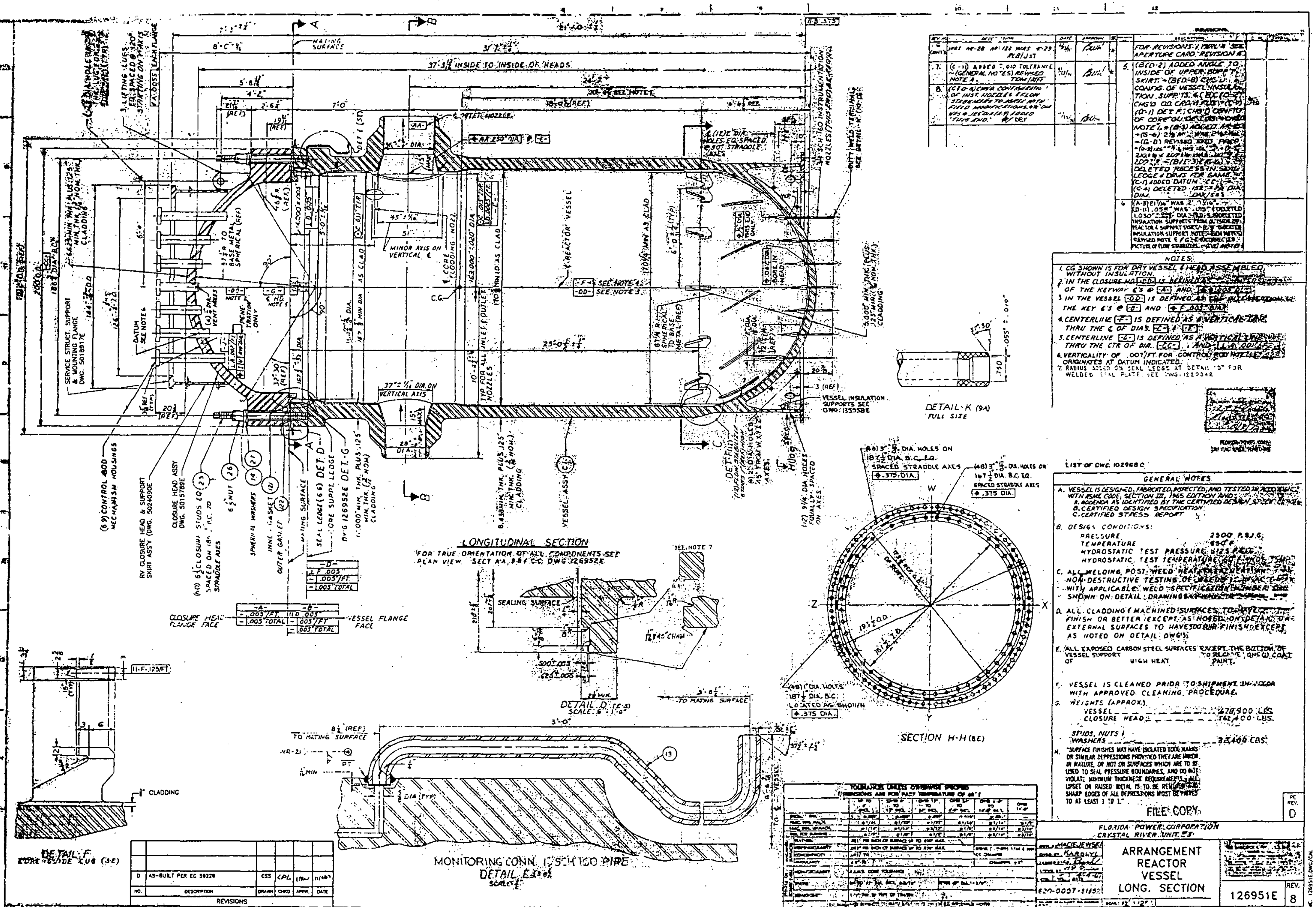
8. References (Optional)

ENCLOSURE
ATTACHMENT A

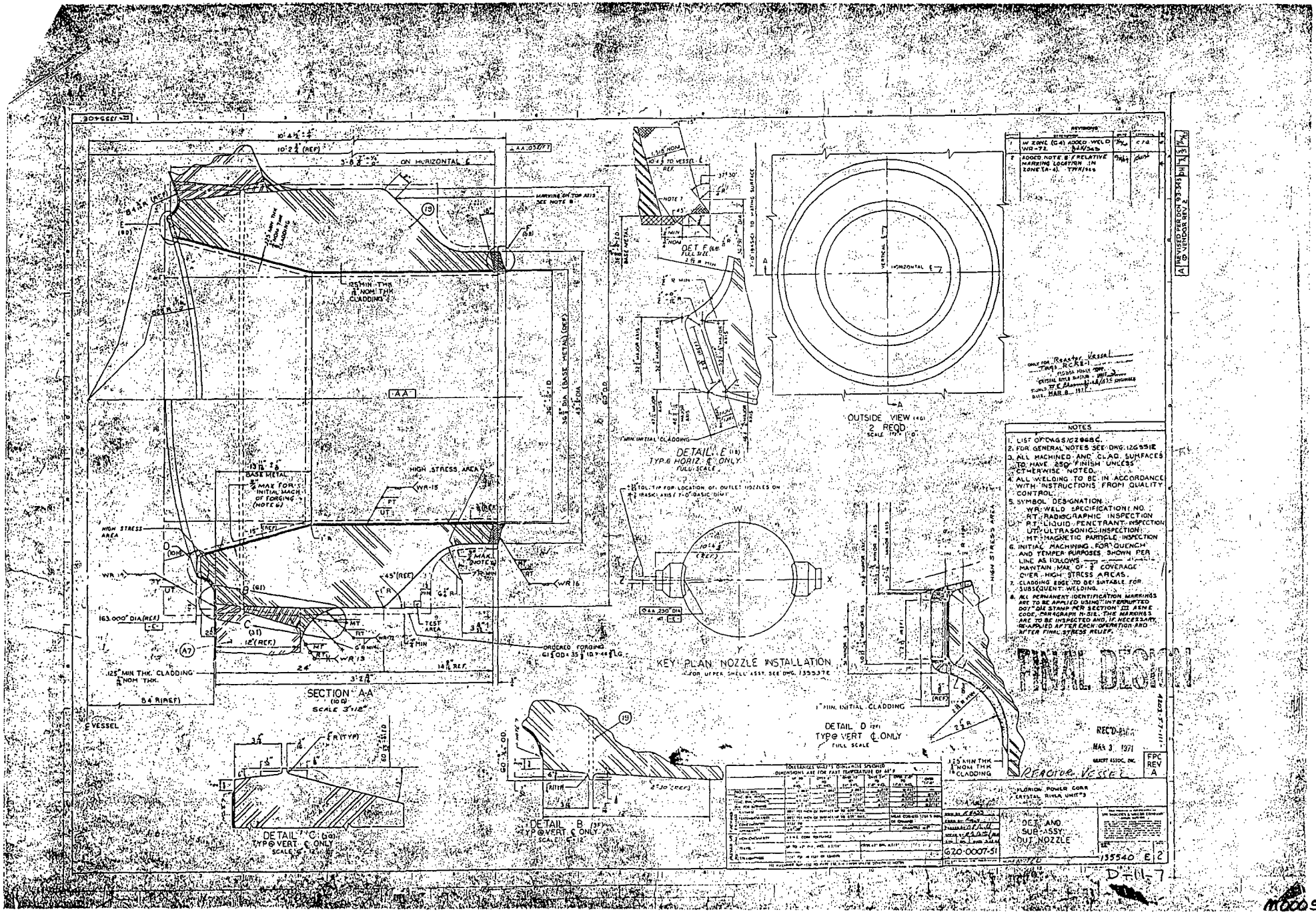
VESSEL DRAWINGS

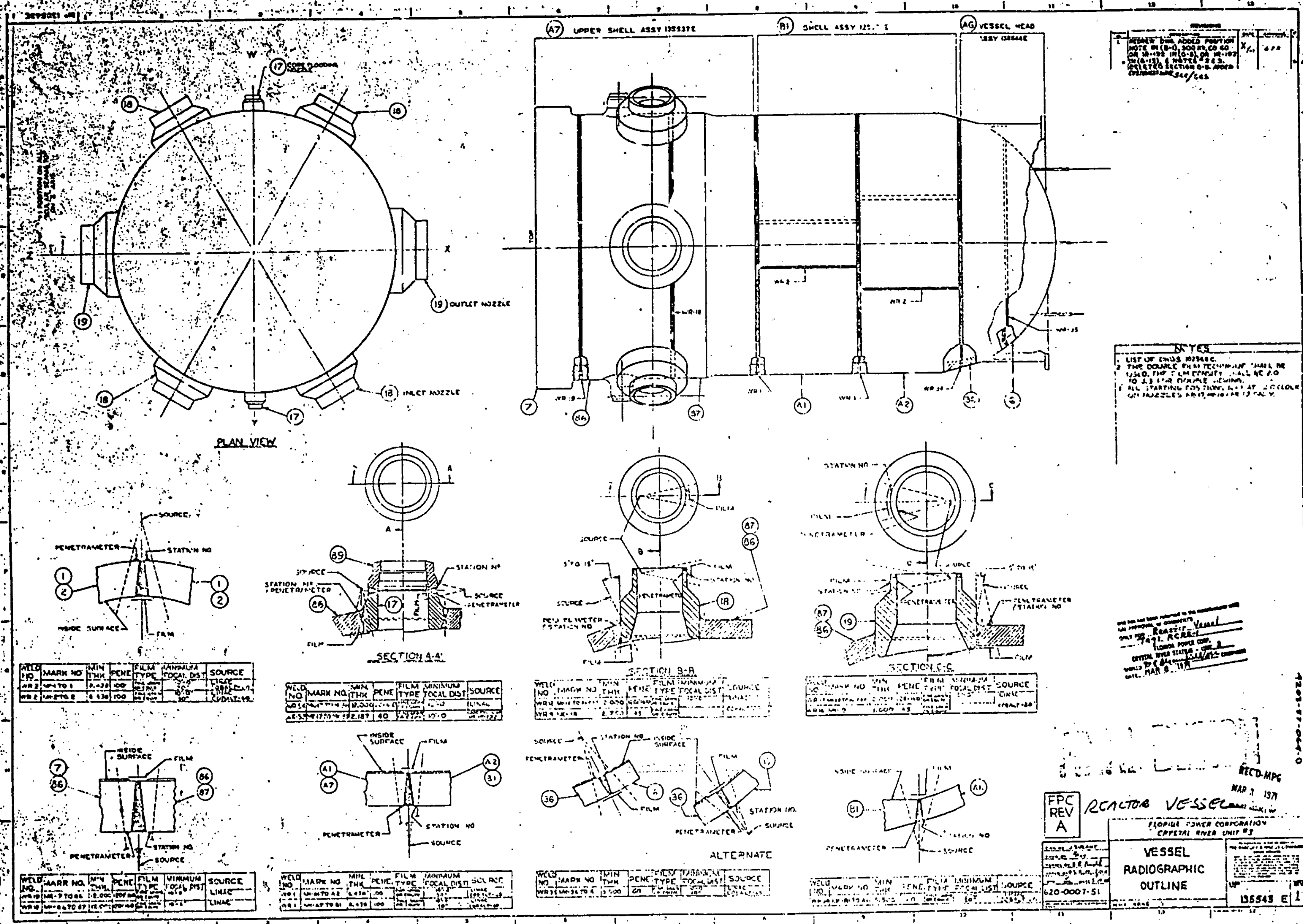
INSERVICE INSPECTION
RELIEF REQUEST #09-003-II, REVISION 1
THIRD TEN-YEAR ISI INTERVAL

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

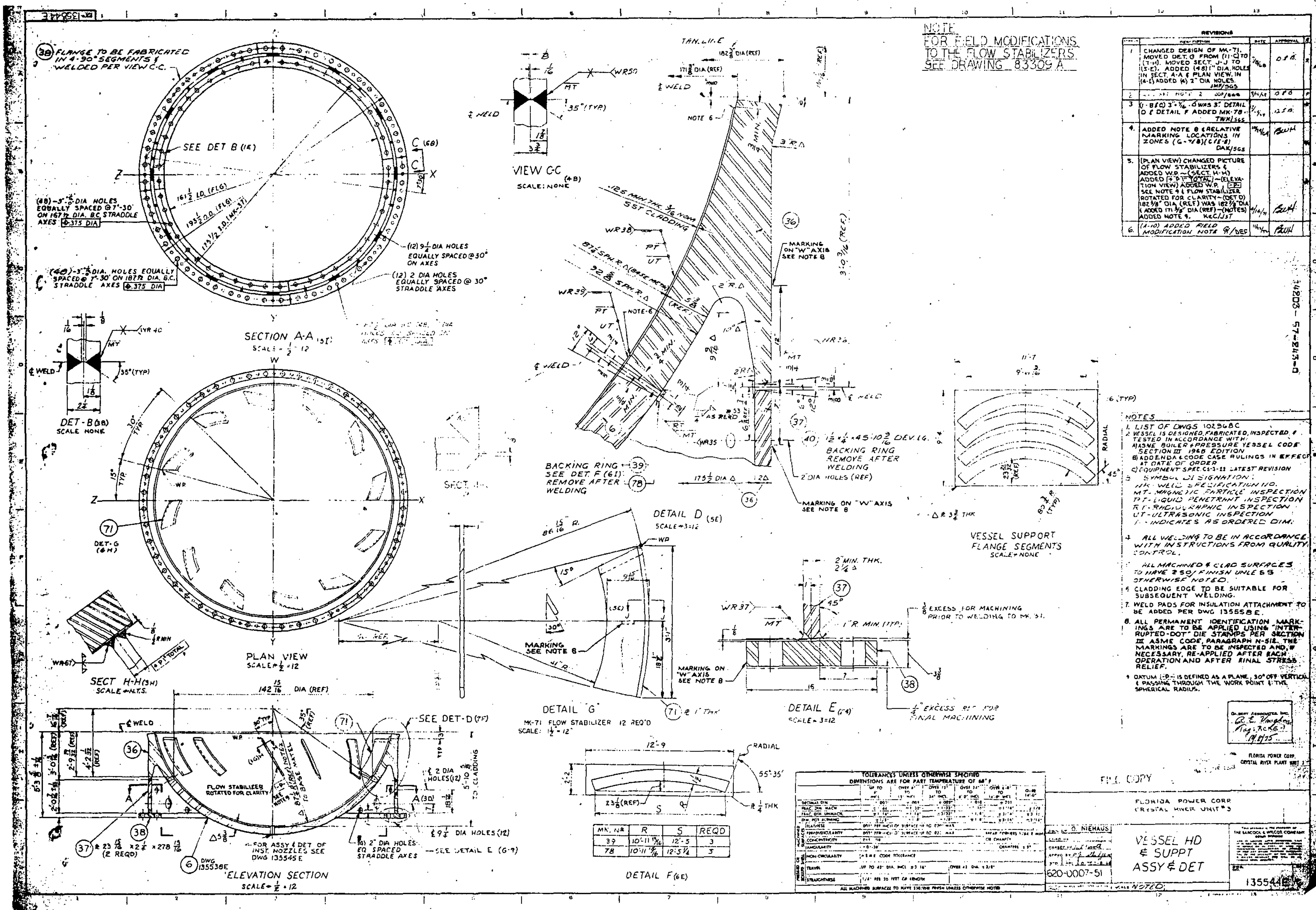

LONGITUDINAL SECTION
FOR TRUE ORIENTATION OF ALL COMPONENTS SEE PLAN VIEW SECT A-A, B-B & C-C DWG 126952E
37'-3 1/2" INSIDE TO INSIDE OF HEADS
REACTOR VESSEL
VESSEL ASSY
DETAIL D
SEALING SURFACE
DETAIL-K (9A) FULL SIZE
SECTION H-H (8E)
DETAIL F
MONITORING CONN. 1" SCH 160 PIPE
DETAIL E
(69) CONTROL ROD MECHANISM HOUSINGS
SERVICE STRUCT. SUPPORT & MOUNTING FLANGE DWG. 5018817E
CLOSURE HEAD ASSY DWG. 5015789E
RV CLOSURE HEAD & SUPPORT SKIRT ASSY (DWG. 5024090E
VESSEL INSULATION SUPPORTS SEE DWG. 135558E
CLOSURE HEAD FLANGE FACE
VESSEL FLANGE FACE
NOTES
1. C.G. SHOWN IS FOR DRY VESSEL & HEAD ASSEMBLED WITHOUT INSULATION.
GENERAL NOTES
A. VESSEL IS DESIGNED, FABRICATED, INSPECTED, AND TESTED IN ACCORDANCE WITH ASME CODE, SECTION III, 1965 EDITION AND
B. DESIGN CONDITIONS:
PRESSURE 2500 P.S.I.G.
TEMPERATURE 650°F
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 35,400 LBS.
LIST OF DWG. 102988C
FILE COPY
FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT #3
ARRANGEMENT REACTOR VESSEL LONG. SECTION
126951E
REV. 8
D AS-BUILT PER EC 58229
REVISIONS

KEY #M000477


SECTION A-A
SCALE 3"=1'-0"
DETAIL C
TYP @ VERT ℄ ONLY
SCALE 3"=1'-0"
DETAIL B
TYP @ VERT ℄ ONLY
DETAIL E
TYP @ HORIZ ℄ ONLY
FULL SCALE
OUTSIDE VIEW
2 REQD
SCALE 1"=1'-0"
KEY PLAN NOZZLE INSTALLATION
DETAIL D
TYP @ VERT ℄ ONLY
FULL SCALE
NOTES
1. LIST OF DWGS 12968C.
2. FOR GENERAL NOTES SEE DWG. 12935E
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: ULTRASONICS INSPECTION;
MT: MAGNETIC PARTICLE INSPECTION
6. INITIAL MACHINING FOR QUENCH AND TEMPER PURPOSES SHOWN PER LINE AS FOLLOWS
MAINTAIN MAX OF 3/4 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" USE STAMP PER SECTION III ASME CODE, PARAGRAPH N-313. THE MARKINGS ARE TO BE INSPECTED AND IF NECESSARY RE-APPLIED AFTER EACH OPERATION AND AFTER FINAL STRESS RELIEF.
REVISIONS
A REVISED PER DCN 93345 & VENDOR REV 2
FINAL DRAWING
RECD DEC
MAR 3 1971
REACTOR VESSEL
FLORIDA POWER CORP
CRYSTAL RIVER UNIT #3
DET AND SUB-ASSY OUT NOZZLE
G20-0007-51
135540 E 2
FPC REV A

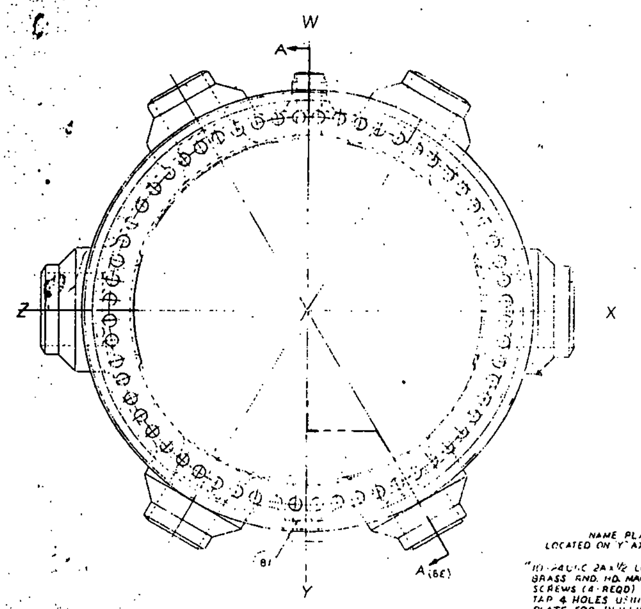


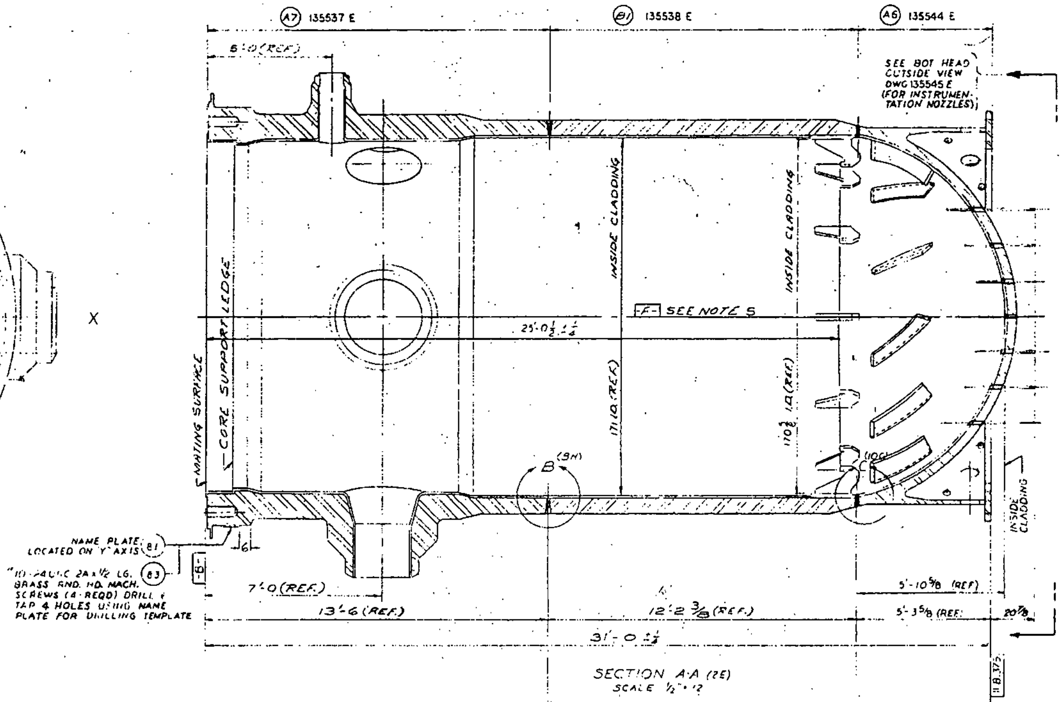
PLAN VIEW
INLET NOZZLE
OUTLET NOZZLE
UPPER SHELL ASSY
SHELL ASSY
VESSEL HEAD
NOTES
SECTION A-A
SECTION B-B
SECTION C-C
ALTERNATE
PENETRAMETER
SOURCE
FILM
STATION NO
INSIDE SURFACE
REVISED PER DCN 93323
VENDOR REV 1
FPC REV A
REACTOR VESSEL
FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT #3
VESSEL RADIOGRAPHIC OUTLINE
620-0007-51
136543 E

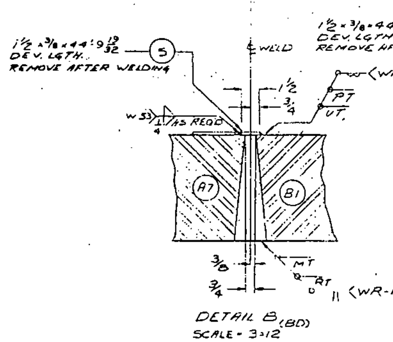

NOTE
FOR FIELD MODIFICATIONS
TO THE FLOW STABILIZERS
SEE DRAWING 83309 A
(38) FLANGE TO BE FABRICATED IN 4-90° SEGMENTS & WELDED PER VIEW C-C.
SEE DET B (1E)
(48)-5"-5/8" DIA HOLES EQUALLY SPACED @ 7°-30' ON 167 1/2 DIA. B.C. STRADDLE AXES
(12) 9 1/4 DIA HOLES EQUALLY SPACED @ 30° ON AXES
(12) 2 DIA HOLES EQUALLY SPACED @ 30° STRADDLE AXES
(48)-5"-5/8" DIA. HOLES EQUALLY SPACED @ 7°-30' ON 187 1/2 DIA. B.C. STRADDLE AXES
SECTION A-A
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.
DETAIL D (5E)
SCALE = 3=12
BACKING RING (39)
SEE DET. F (6E)
REMOVE AFTER (78)
WELDING
DETAIL G
MK-71 FLOW STABILIZER 12 REQ'D
SCALE: 1 1/2 = 12
MARKING SEE NOTE 8
BACKING RING REMOVE AFTER WELDING
MARKING ON "W" AXIS SEE NOTE 8
VESSEL SUPPORT FLANGE SEGMENTS
SCALE = NONE
DETAIL E (G-4)
SCALE = 3=12
1/8 EXCESS FOR MACHINING PRIOR TO WELDING TO MK. 37.
1/4" EXCESS REQ FOR FINAL MACHINING
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 (G-9)
SEE DET-D (7F)
DETAIL F (6E)
MK. NO | R | S | REQD
39 | 10-11 15/16 | 12-5 | 3
78 | 10-11 15/16 | 12-5 1/4 | 3
REVISIONS
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-E) ADDED (4) 2" DIA HOLES. JMF/SGS
2 | SEE NOTE 2
3 | (1-B & C) 3'-9/16-0 WAS 3'. DETAIL D & DETAIL F ADDED MK-78. TWK/SGS
4. | ADDED NOTE 8 & RELATIVE MARKING LOCATIONS IN ZONES (G-7/8)(C/E-8) DAK/SGS
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 1/8" DIA & ADDED 171 3/8" DIA (REF) ~ (NOTES) ADDED NOTE 9. KEC/JST
6. | (A-10) ADDED FIELD MODIFICATION NOTE DEF
NOTES
1. LIST OF DWGS 102968C
2. VESSEL IS DESIGNED, FABRICATED, INSPECTED & TESTED IN ACCORDANCE WITH:
A) ASME BOILER & PRESSURE VESSEL CODE SECTION III 1968 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
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.
FLORIDA POWER CORP.
CRYSTAL RIVER PLANT UNIT 3
TOLERANCES UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE FOR PART TEMPERATURE OF 68° F
ALL MACHINED SURFACES TO HAVE 250/RHR FINISH UNLESS OTHERWISE NOTED
FILE COPY
FLORIDA POWER CORP
CRYSTAL RIVER UNIT #3
O. NIEHAUS
620-0007-51
VESSEL HD & SUPPT ASSY & DET
THE BABCOCK & WILCOX COMPANY
SCALE NOTED
135544E

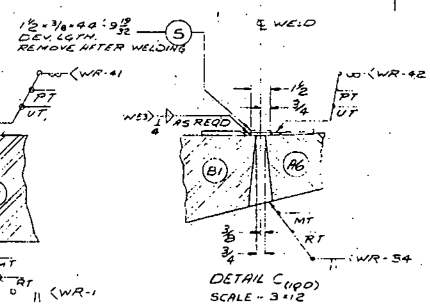
REVISIONS

NO.	DESCRIPTION	DATE	APPROVAL
1	DETAILS B/C MH-G: 3/8 WAS 1/4 ELC/SGS	11/17/[illegible]	O.E.G.
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	[illegible]	[illegible]
3.	(B-6) DELETED THERMAL SLEEVE. DAK/SGS	[illegible]	[illegible]
4.	(C-10) CORRECTED PICTURE OF FLOW STABILIZERS. RLB/JJT	[illegible]	[illegible]
5.	(F-1) ADDED FIELD MODIFICATION NOTE GH/DEF	[illegible]	[illegible]









NOTES

1. LIST OF DWGS 102968 C.
2. FOR GENERAL NOTES SEE DWG 126051 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 9 ON DWG. 135537 E.

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

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 .020" MAX.	
	PERPENDICULARITY	.003" PER INCH OF SURFACE UP TO .020" MAX.	BREAK CORNERS 1/64 X MIN. OR CHAMFER
	CONCENTRICITY	.015" TIR	
	ANGULARITY	±0°-30'	CHAMFERS ±2°
ROLLED OR BOLTED SHELL	NON-CIRCULARITY	A.S.M.E. CODE TOLERANCE	
	TRAVEL	UP TO 42" DIA. INCL. ±1/16"	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 [illegible]
PASSED BY [illegible]
APPVD. BY R.J. [illegible]
DATE 6-17-[illegible]

620-0007-51 & 52

FILE COPY

FLORIDA POWER CORPORATION
CRYSTAL RIVER UNIT #3

VESSEL ASSY & FINAL MACHINING

THE BABCOCK & WILCOX COMPANY

SCALE NOTED

135546 E

M000[illegible]

R.L. Vaughn
Reg: [illegible]
10/8/75

FLORIDA POWER CORP.
CRYSTAL RIVER PLANT UNIT 3

-R1075 4203

ENCLOSURE

ATTACHMENT B

COVERAGE DATA

INSERVICE INSPECTION
RELIEF REQUEST #09-003-II, REVISION 1
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%**		

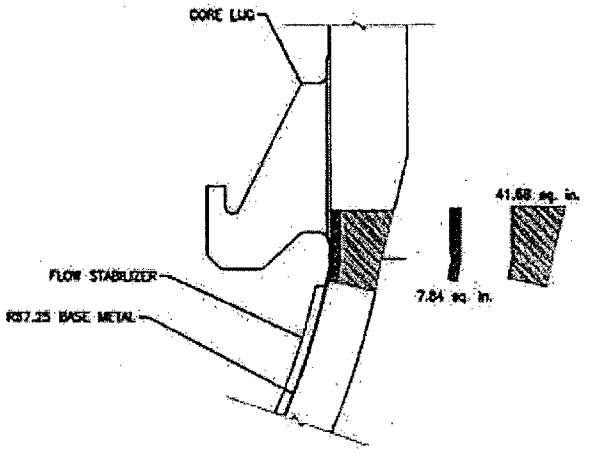
Examination Coverage Calculations (*All Treated as Single Sided Examination*)

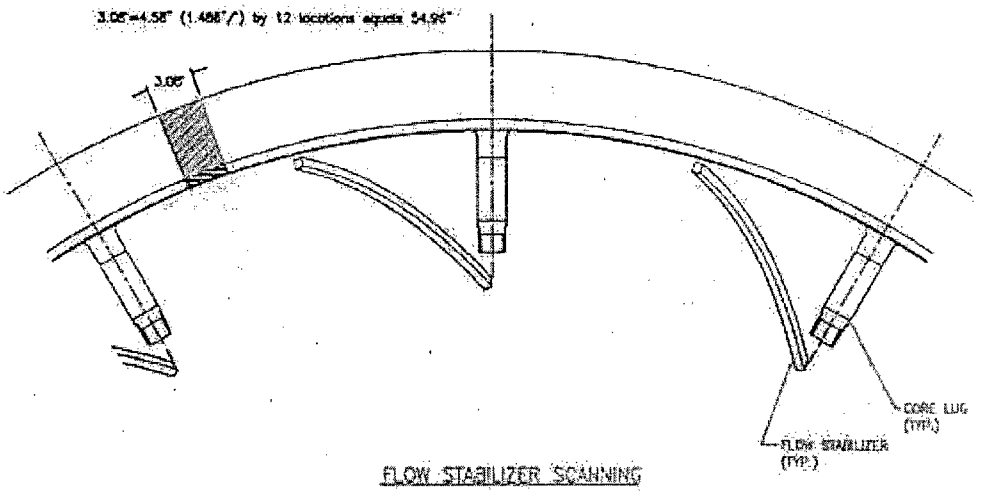
INNER 15%T "LOWER" (LIMITATIONS)

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%**		

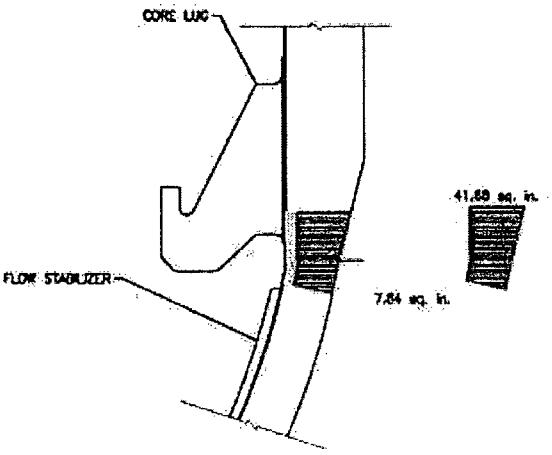


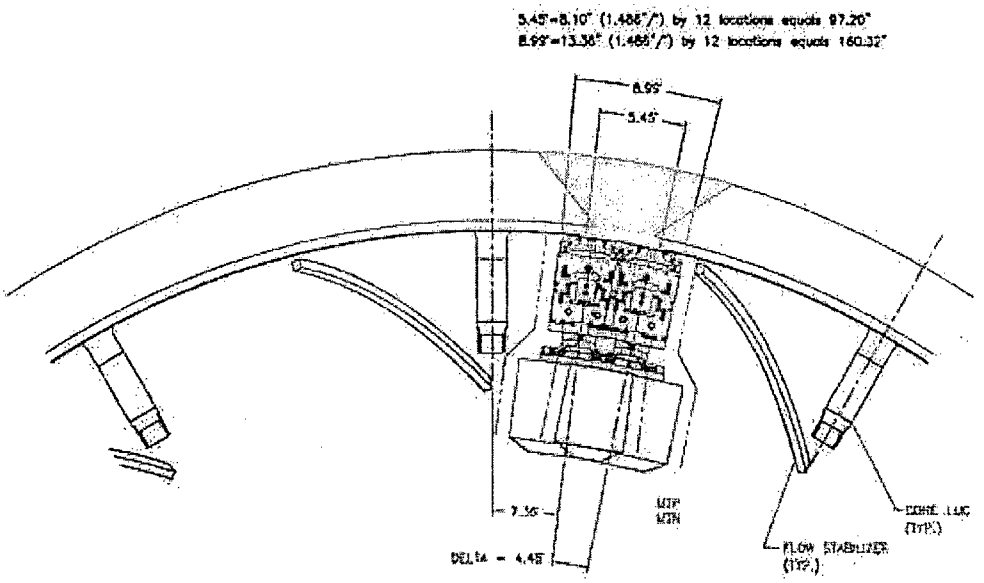


FLOW STABILIZER SCANNING

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.: B1.2.1



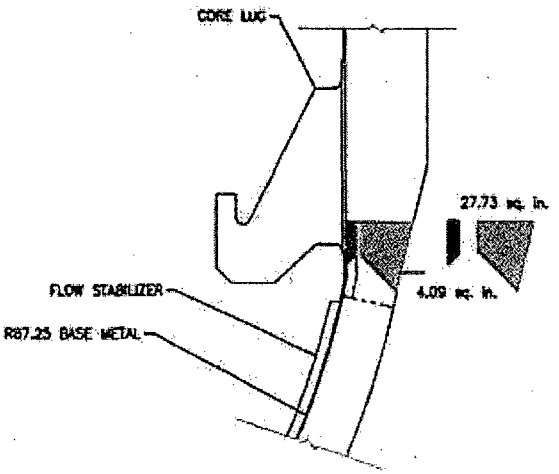


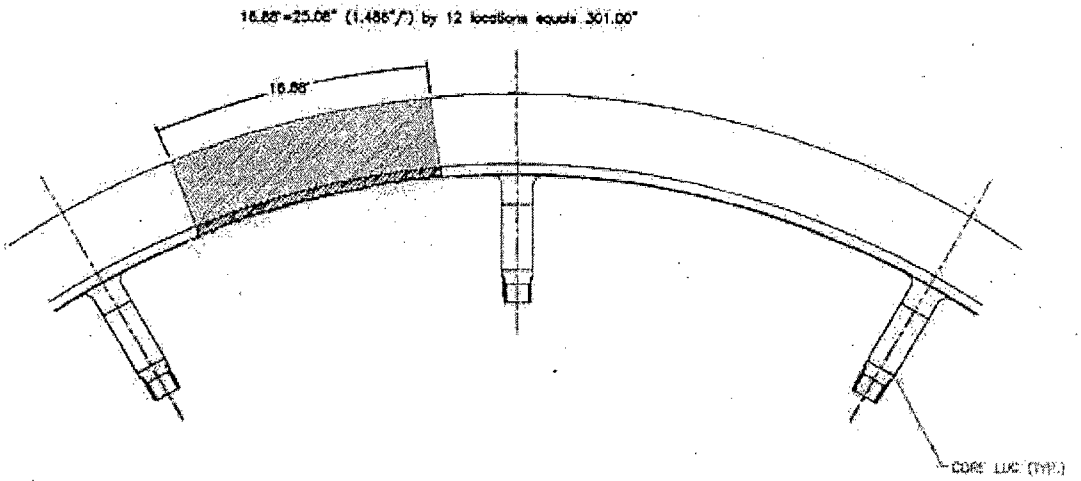
FLOW STABILIZER SCANNING

Weld Identification
TWS No.: W09
CR-3 No.: B12-1

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.

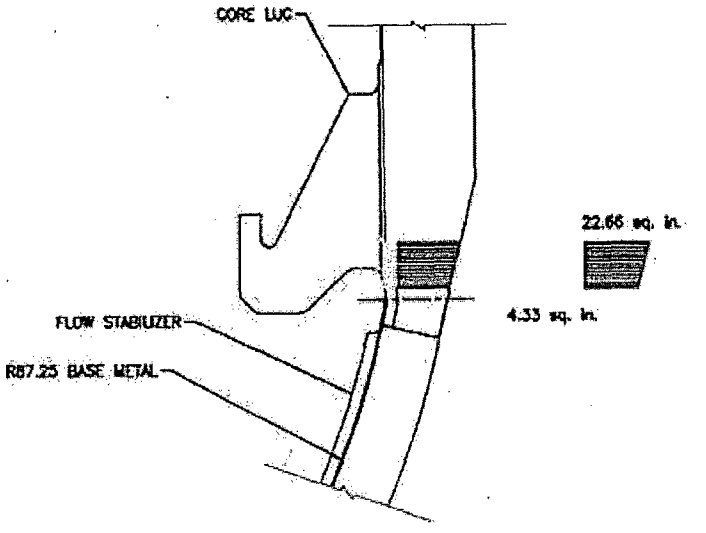




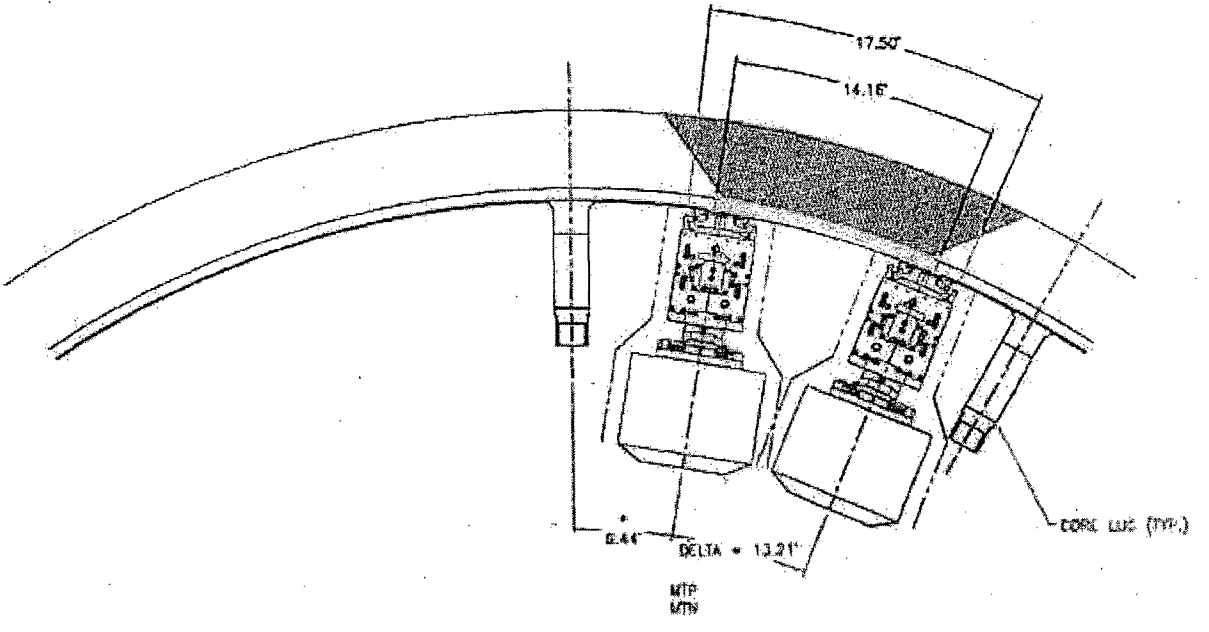
CORE LUG SCANNING

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

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



14.16"=21.07" (1.486"/) by 12 locations equals 252.84"
17.50"=26.00" (1.486"/) by 12 locations equals 312.0"



CORE LUG SCANNING

Weld Identification
TWS No.: W09
CR-3 No.: B12.1

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

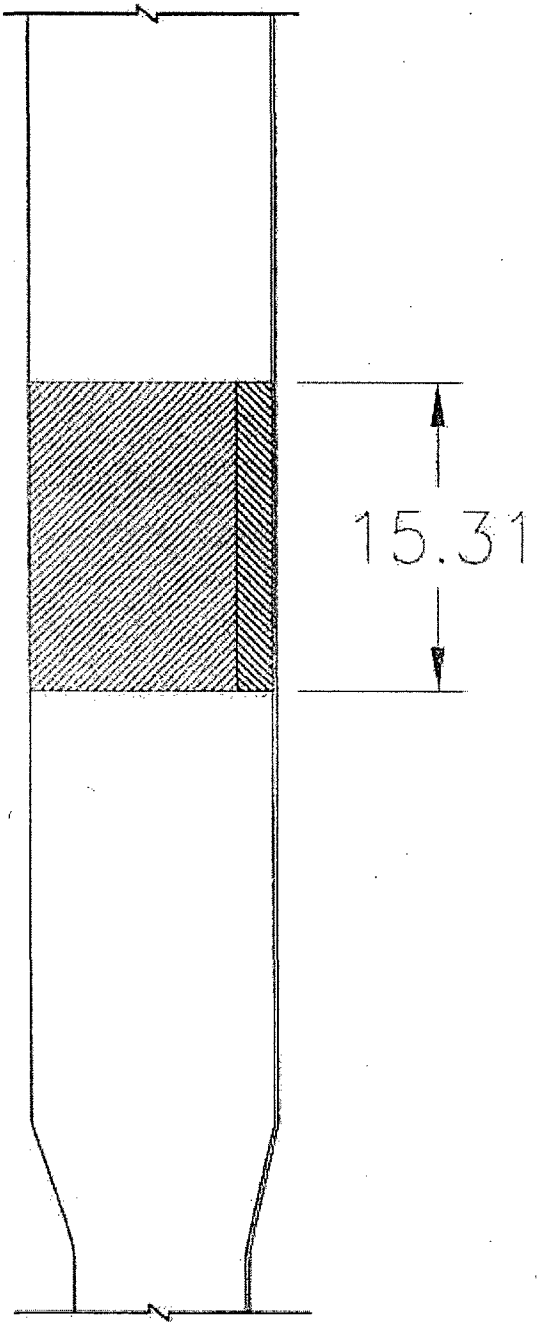
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	*Limited*	*Limitations*
1 & 2	45L/45S	Up & Down	See Notes		37785.4	43643.6	86.6%	Yes	Nozzles
3	45L/45S	CW	See Notes		43072.7	43643.6	98.7%	Yes	Nozzles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

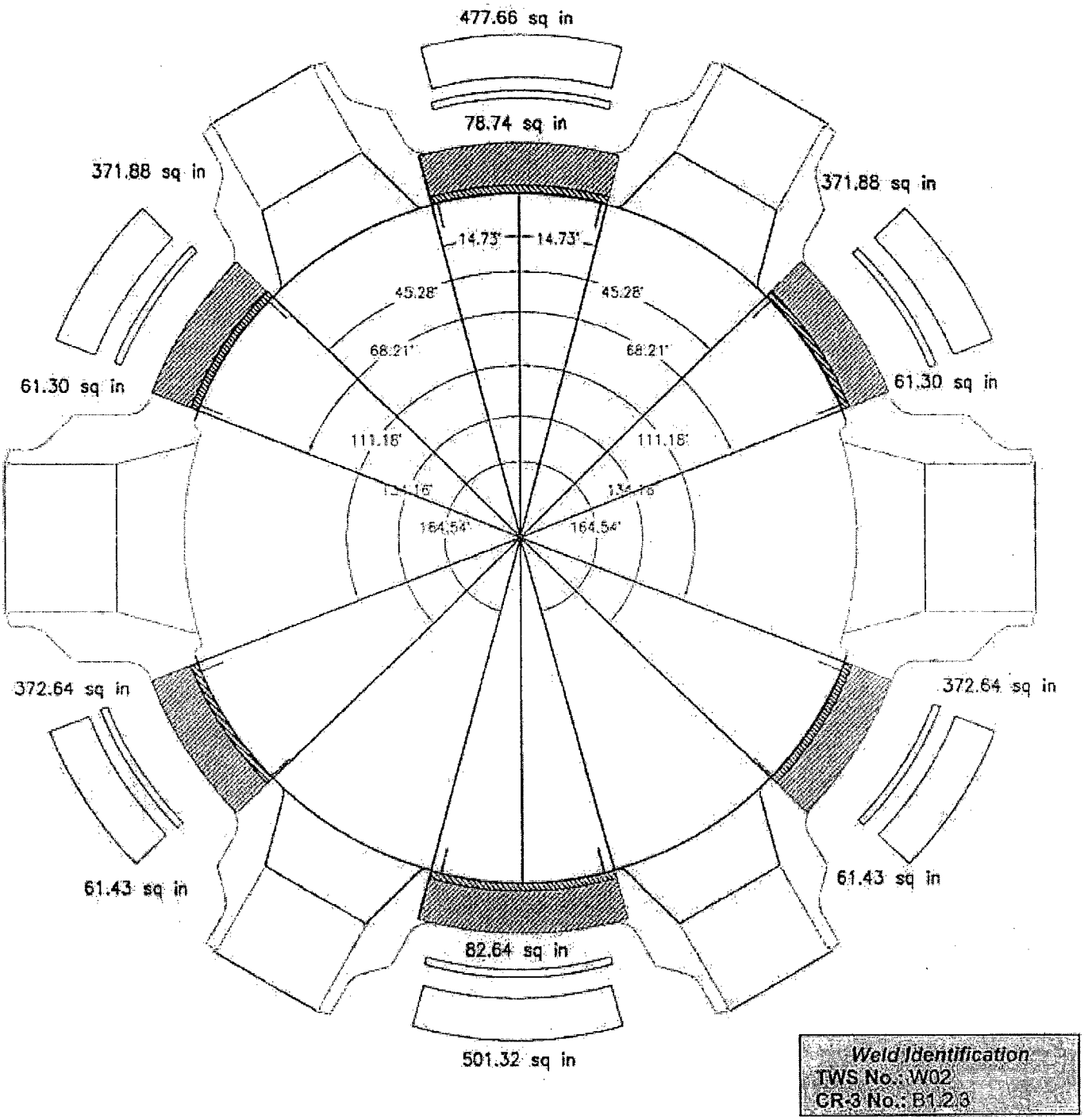
		Total Area to be Examined			
	Vertical	Horizontal Area		Total Volume	
Scan Area	Height	15%	85%	15%	85%
Z-W & W-X	15.31	86.98	527.62	1331.66	8077.86
OUT Z & Z-W	15.31	74.39	451.27	1138.91	6908.94
Y-Z & OUT Z	15.31	73.59	446.44	1126.66	6835.00
X-Y & Y-Z	15.31	86.98	527.62	1331.66	8077.86
OUT X & X-Y	15.31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

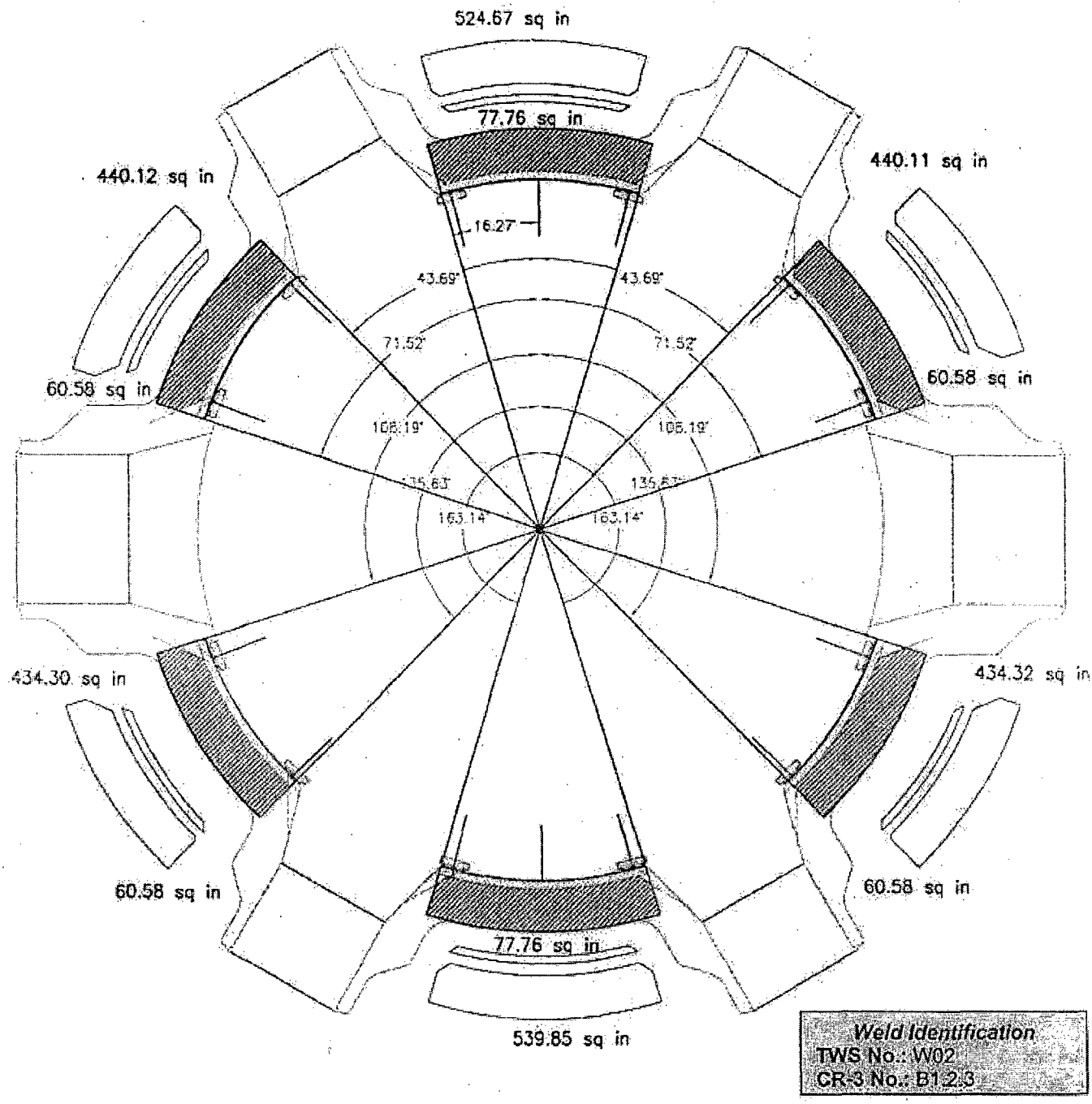


15% & 85%T Coverage Plot Typical Cross Section (Both Scans Axial & Circ)



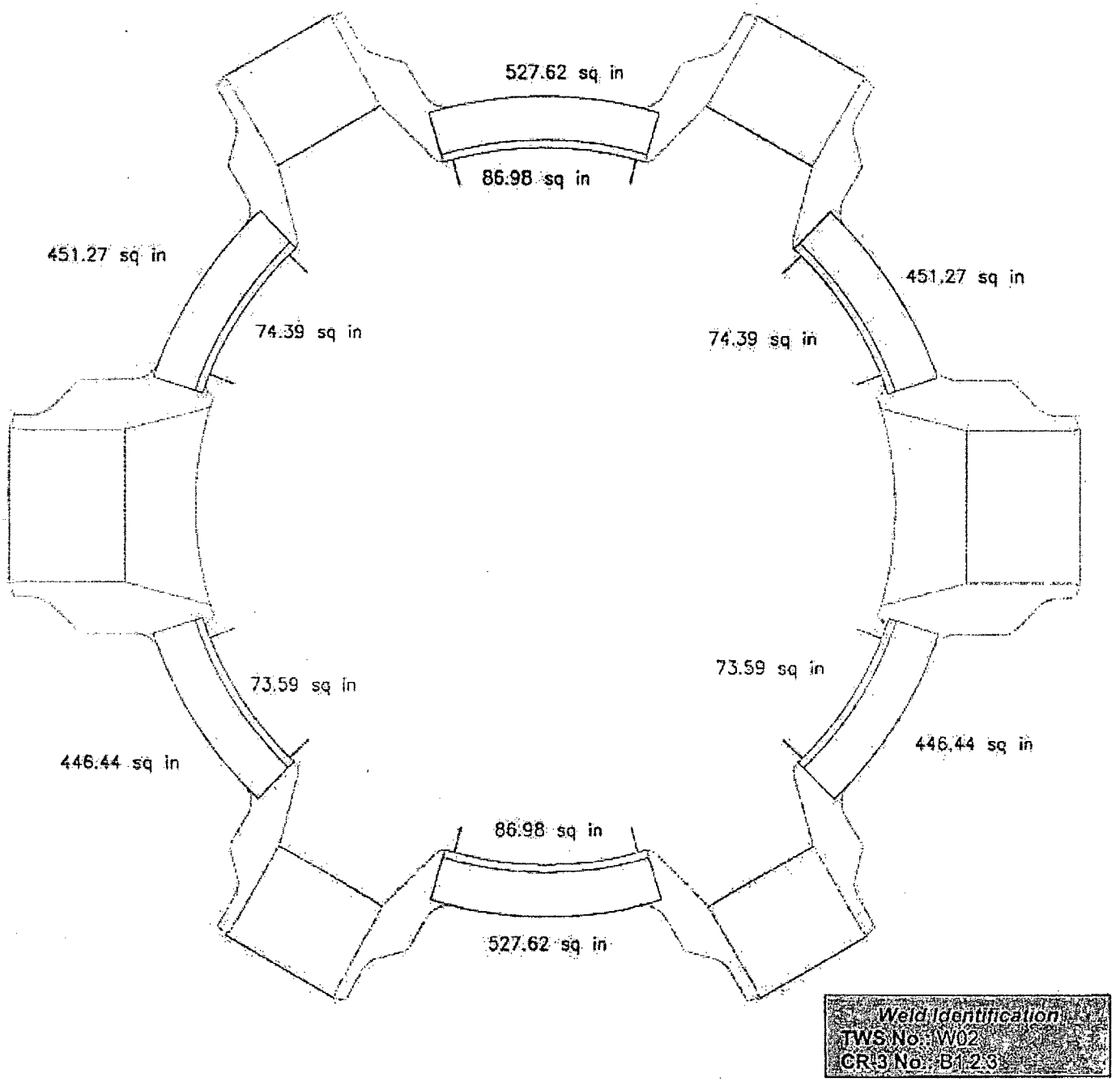
15% & 85%T Coverage Plot (Axial Scan – Perpendicular to weld)

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: 67.2% **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%		

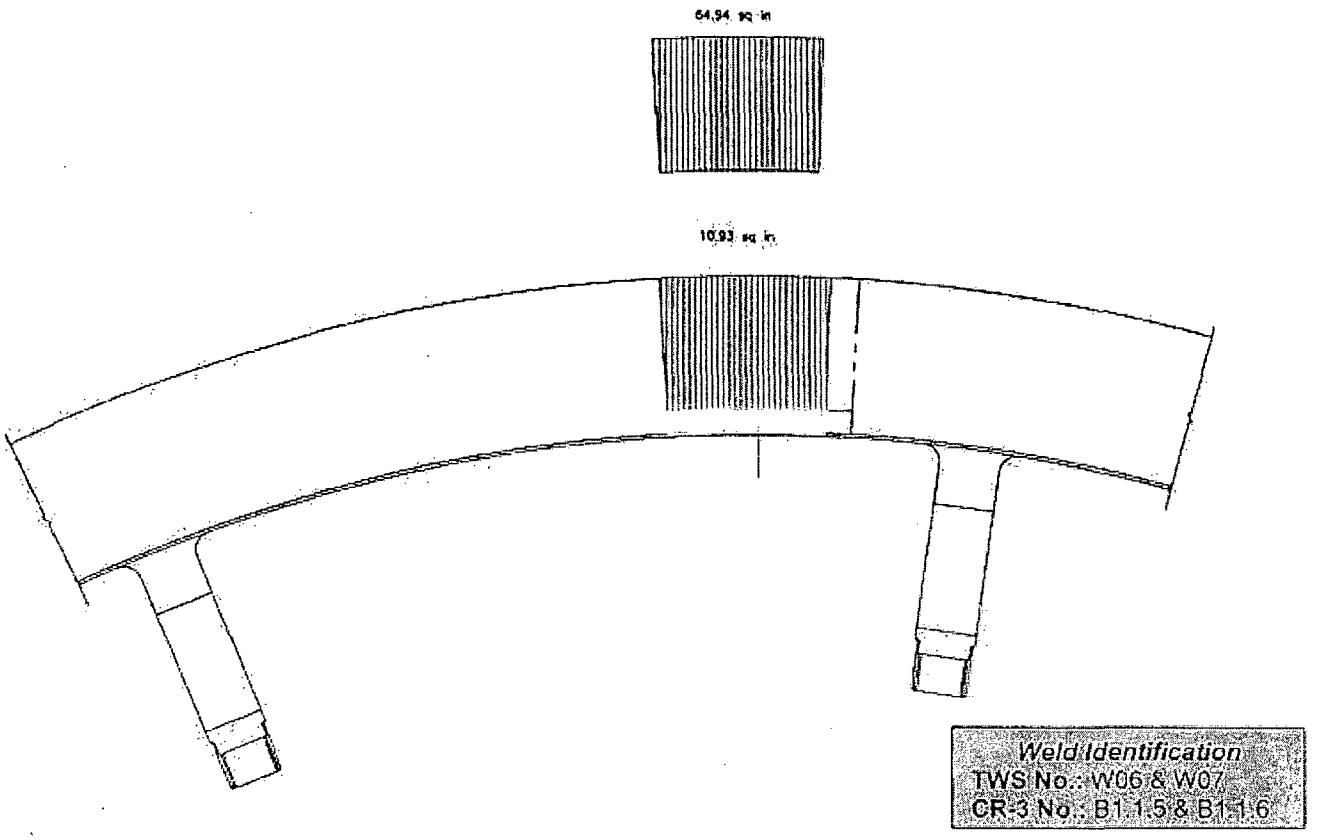
Examination Coverage Calculations (*CW & CCW Treated as Single Sided Examination*)

INNER 15%T (LIMITATIONS)

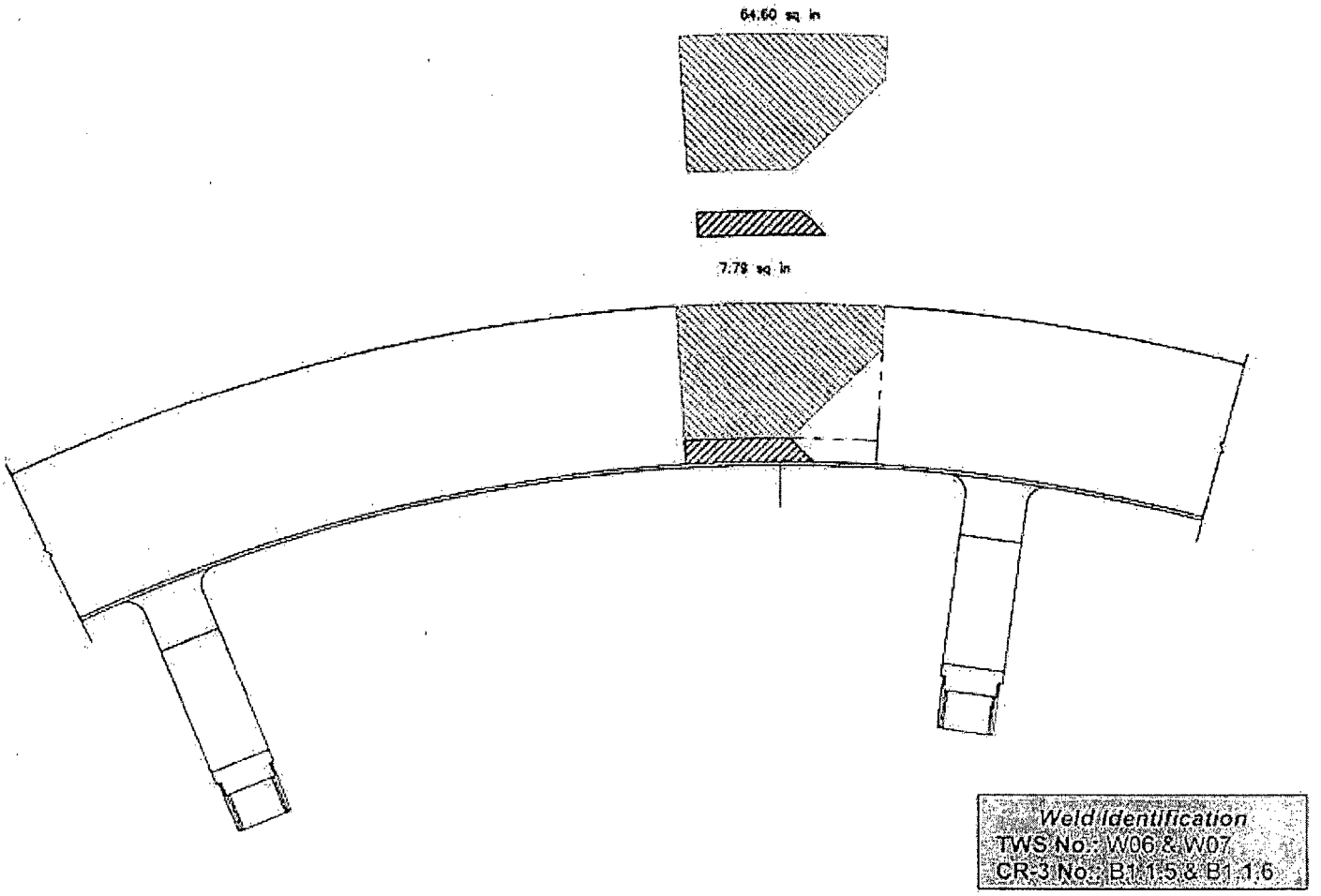
Entry #	Exam. Angle (deg.)	Beam Direction	Area Examined (sq. in.)	Length Examined (in.)	Volume Examined (cu. in.)	Volume Required (cu. in.)	Percent Examined	Limited	Limitations
1	70L/45L	Up	10.93	21.69	237.1	930.8	25.5%	Yes	Lugs & Flow Stabilizers
2	70L/45L	Down	10.93	21.69	237.1	930.8	25.5%	Yes	Lugs & 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	84.50	16.05	1036.8	5531.5	18.7%	Yes	Lugs & Flow Stabilizers
				Totals:	*3853.9*	*16594.6*	*23.2%*		

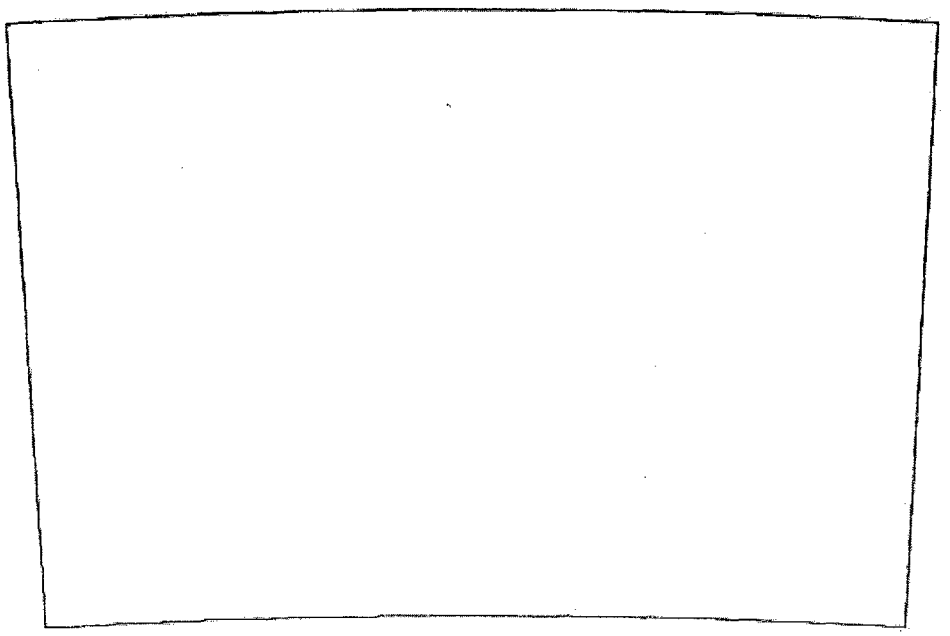


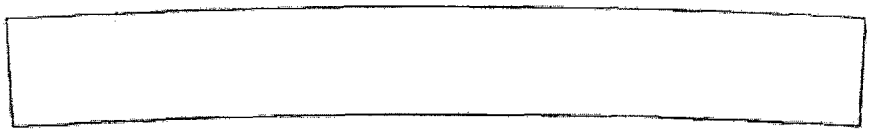
15% & 85%T Coverage Plot (Axial Scan – Parallel to weld)



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

75.65 sq in

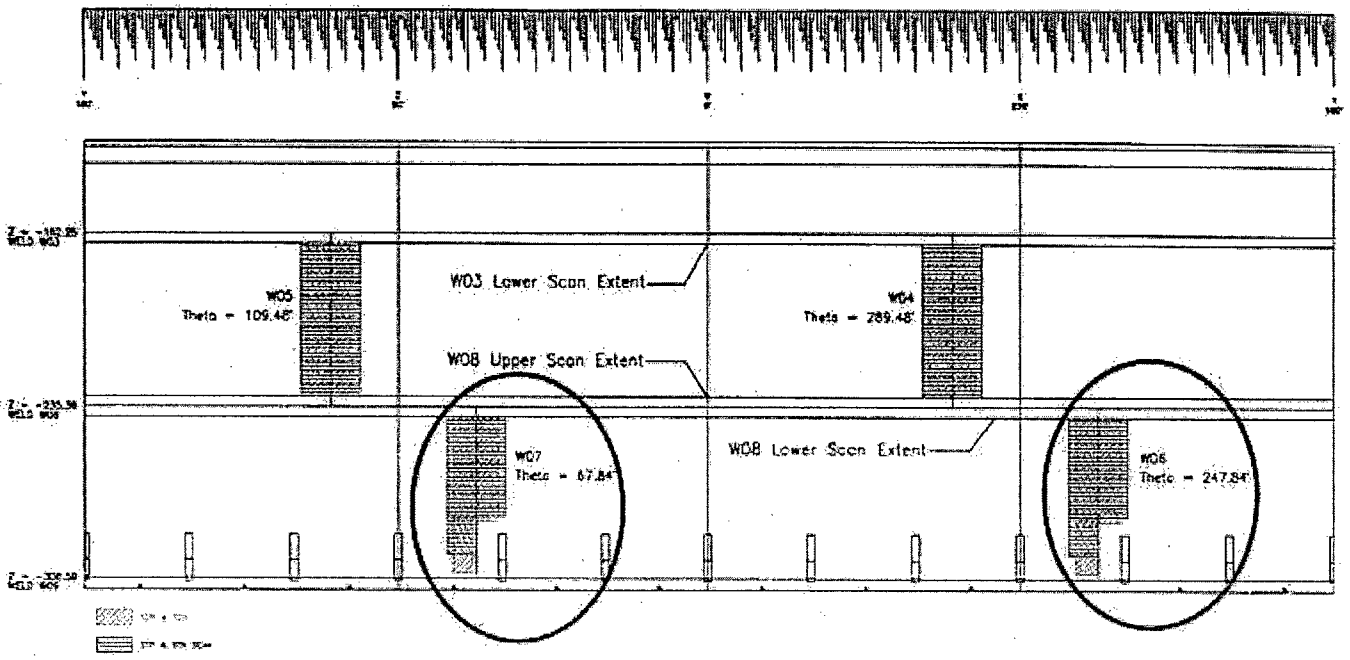




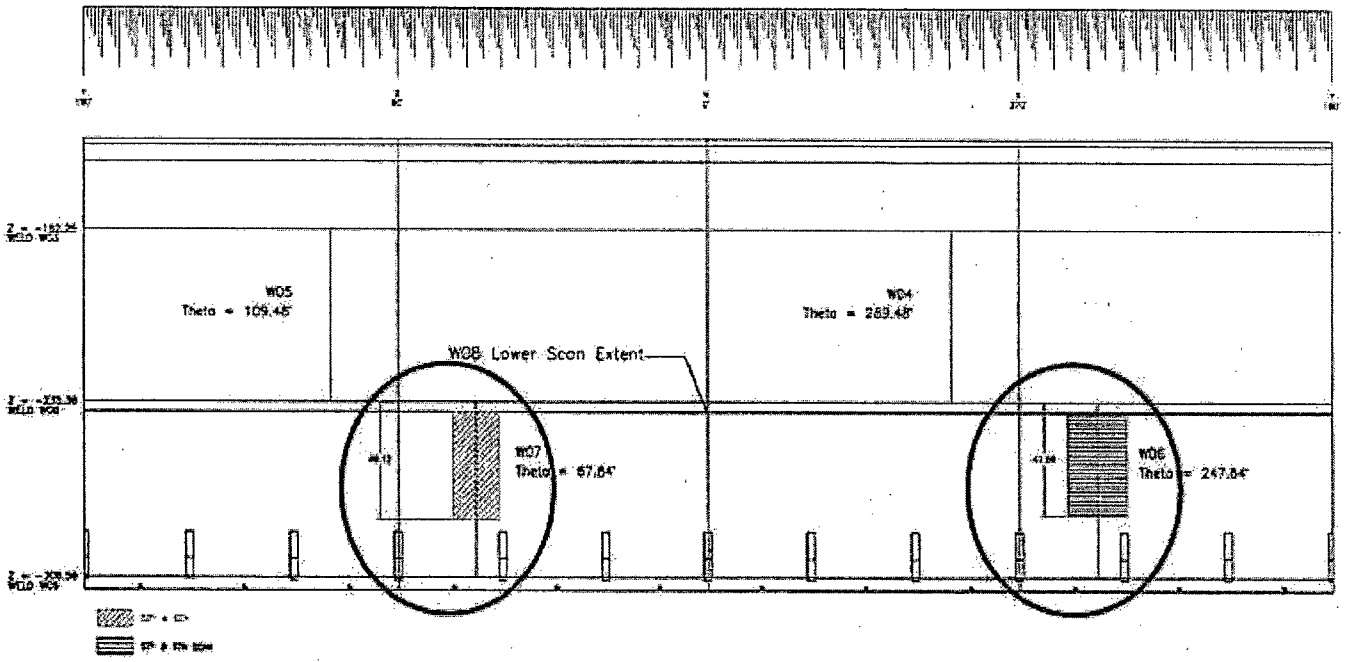
12.73 sq in

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

15% & 85%T Total Cross Sectional Area

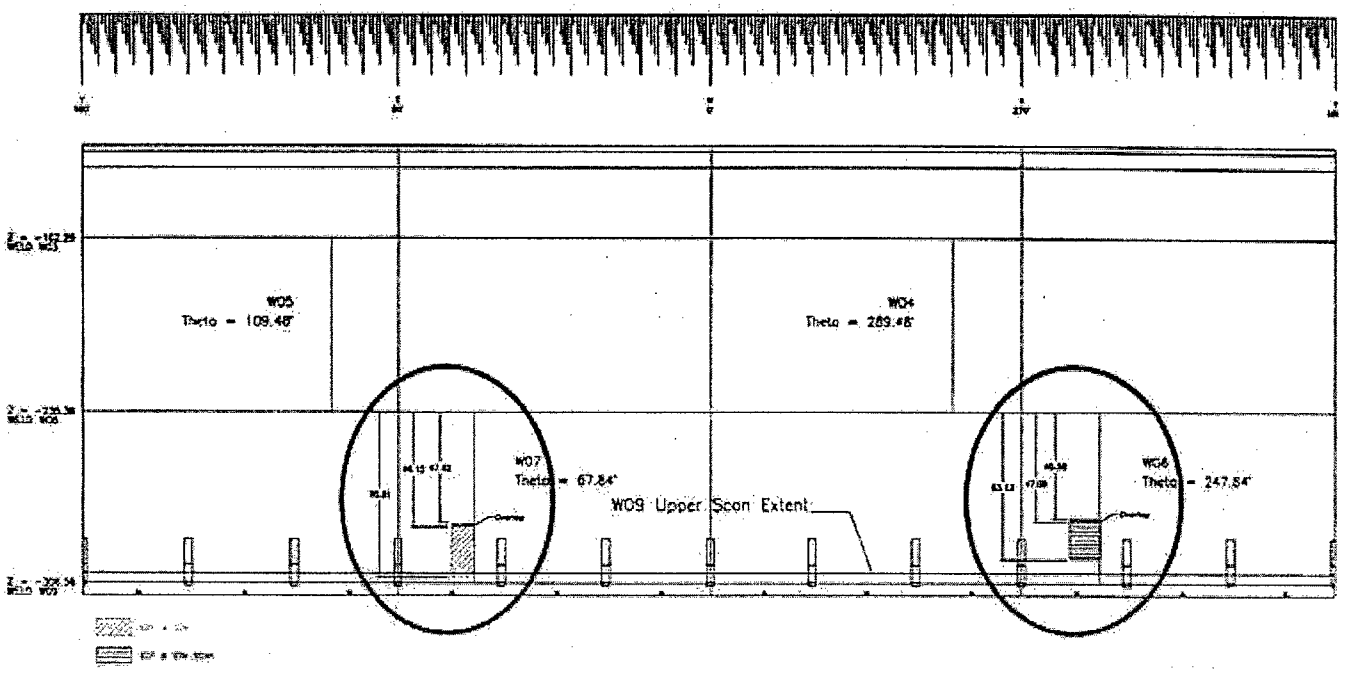


View from Vessel ID looking out All Scans (W06 & W07 circled)



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.: B1.1.5 & B1.1.6

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	

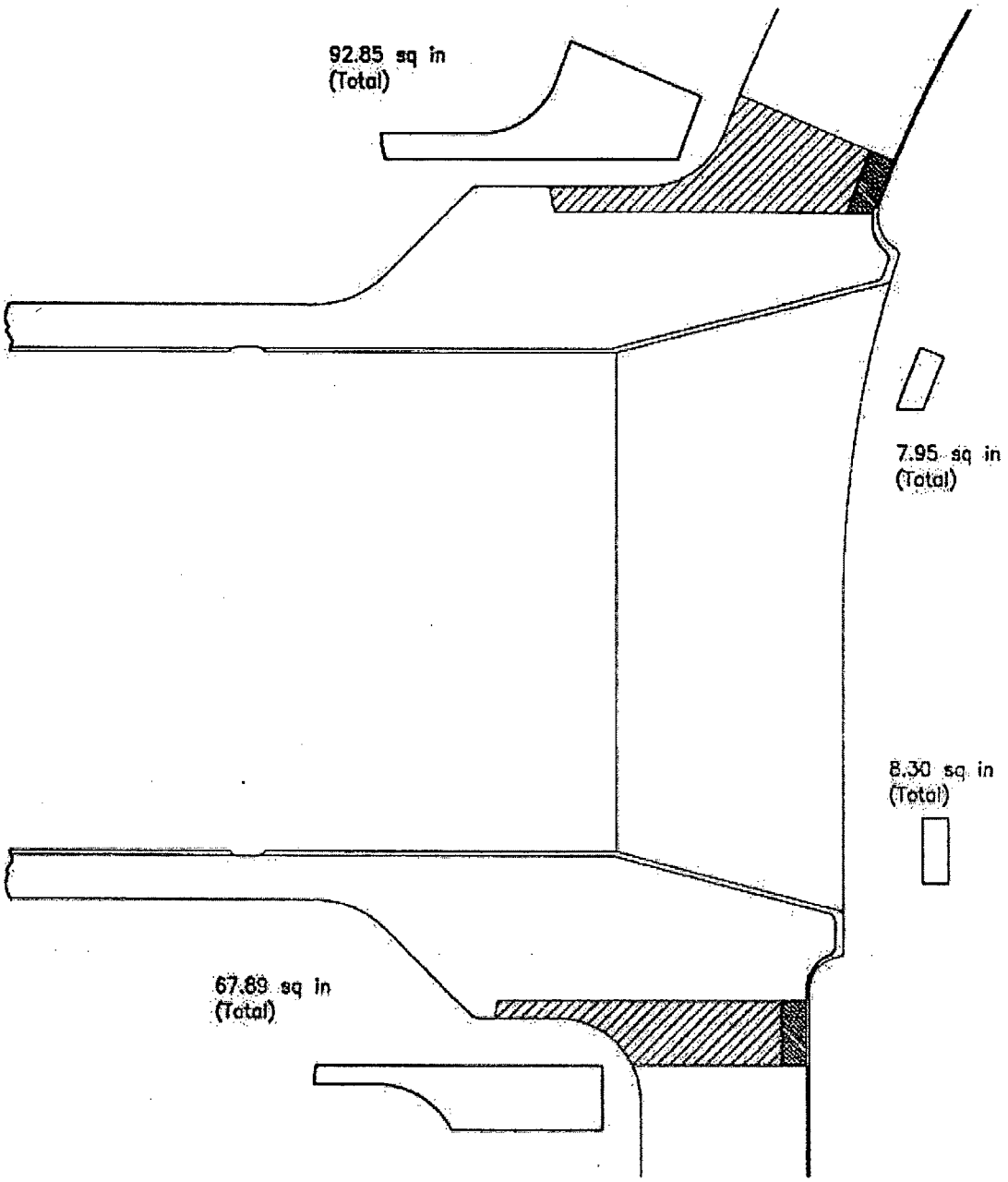
Examination Coverage Calculations (*Treated as Dual Sided Examination*)

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%		

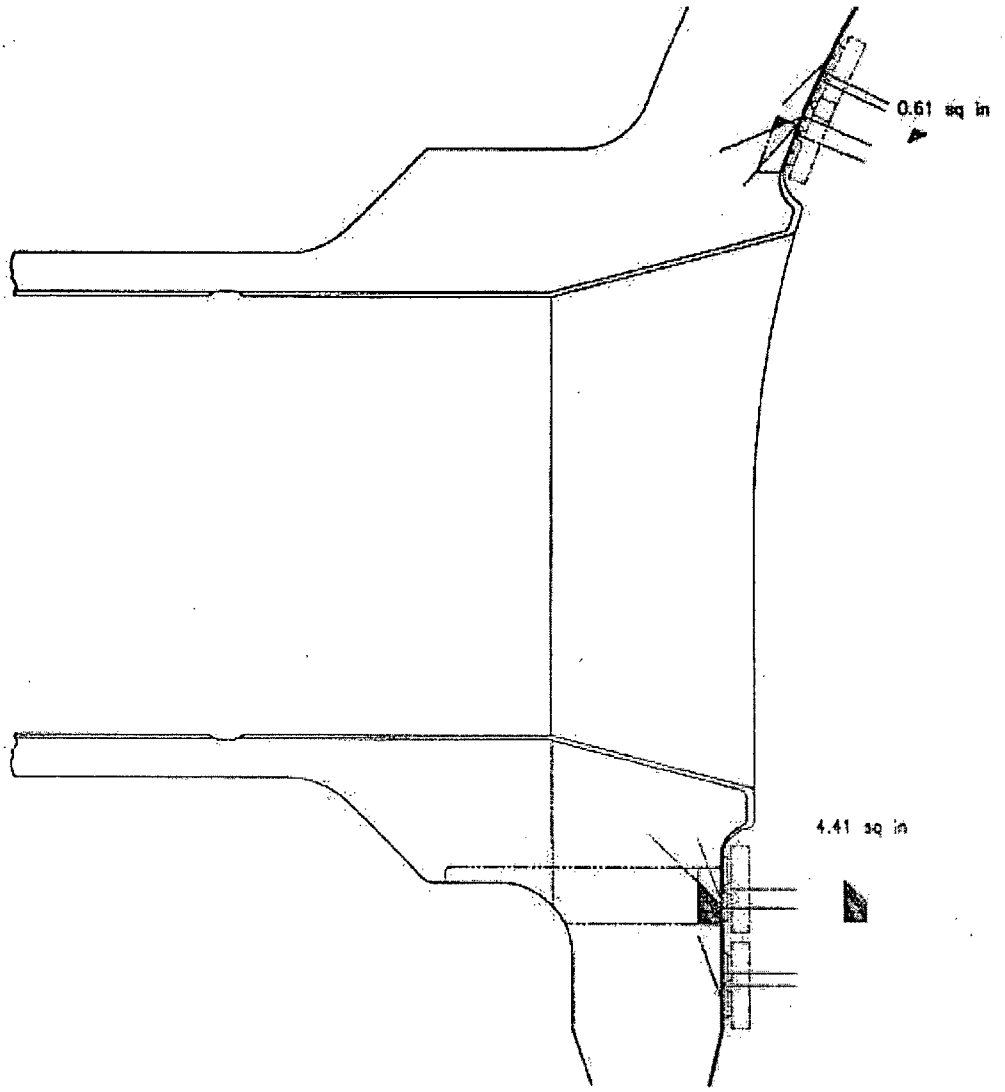
OUTER 85%T

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%**		



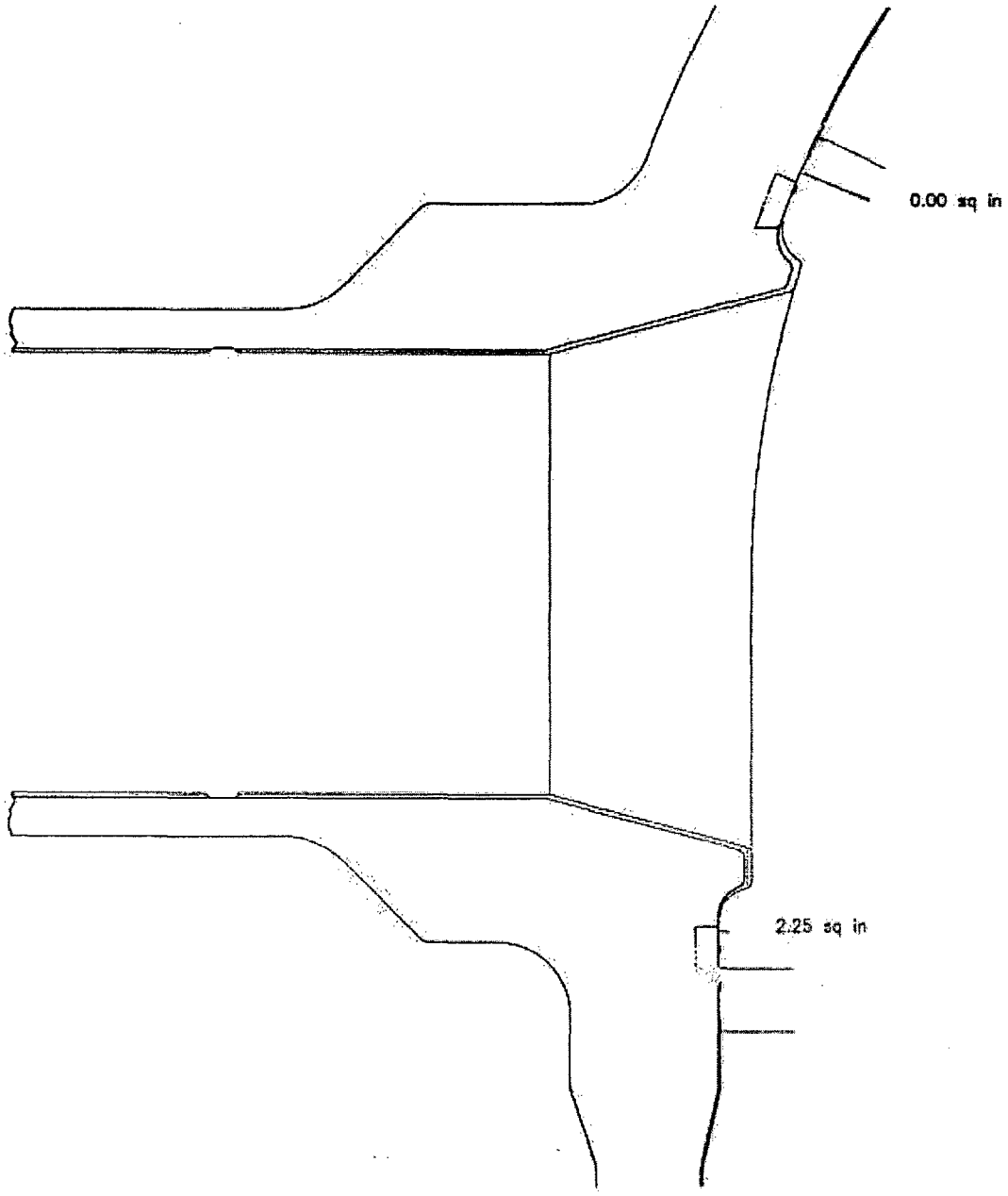
15% & 85%T Coverage Plot (Radial Scan – Perpendicular to weld from Nozzle Bore)

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)