

Omaha Public Power District
444 South 16th Street Mall
Omaha, Nebraska 68102-2247
402/636-2000

March 23, 1994
LIC-94-0078

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, DC 20555

References: 1. Docket No. 50-285
2. Letter from OPPD (W. G. Gates) to NRC (Document Control Desk)
dated September 10, 1993 (LIC-93-0232)

Gentlemen:

SUBJECT: Reactor Vessel Weld Inspection Data to Support Inservice Inspection
Program Plan for Fort Calhoun Station (TAC No. M84936)

The Reference 2 letter provided responses to an NRC Request for Additional Information concerning the Fort Calhoun Station (FCS) Third Ten-Year Interval Inservice Inspection Program Plan and Associated Relief Requests. These responses were discussed in a telephone conference call held on March 15, 1994, which included representatives from Omaha Public Power District (OPPD), the NRC, and INEL.

In the Reference 2 response to Request H, OPPD stated that the one-time 100% examination of the reactor vessel shell welds was completed during the 1992 Refueling Outage. During the conference call noted above, the NRC requested additional information showing FCS vessel circumferential and longitudinal welds in order to ascertain the scope of the inspection.

In response, attached are selected documents from the 1992 Inservice Inspection (ISI) of the Reactor Pressure Vessel welds in the beltline region as performed by Southwest Research Institute. ISI Isometric Drawing A-1 shows that the beltline region welds are A-2, A-3, B-2, B-3, C-2, C-3, and C-11. To facilitate review, information on welds outside of the beltline region is not included. Appendix G and applicable tables from the ISI report show the calculations for coverage of these weld exams for all scans and angles. Further details of these calculations are shown in Figures 1, 4, and 5.

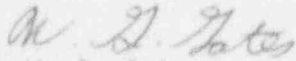
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Page 2

Please contact me if you have any questions.

Sincerely,

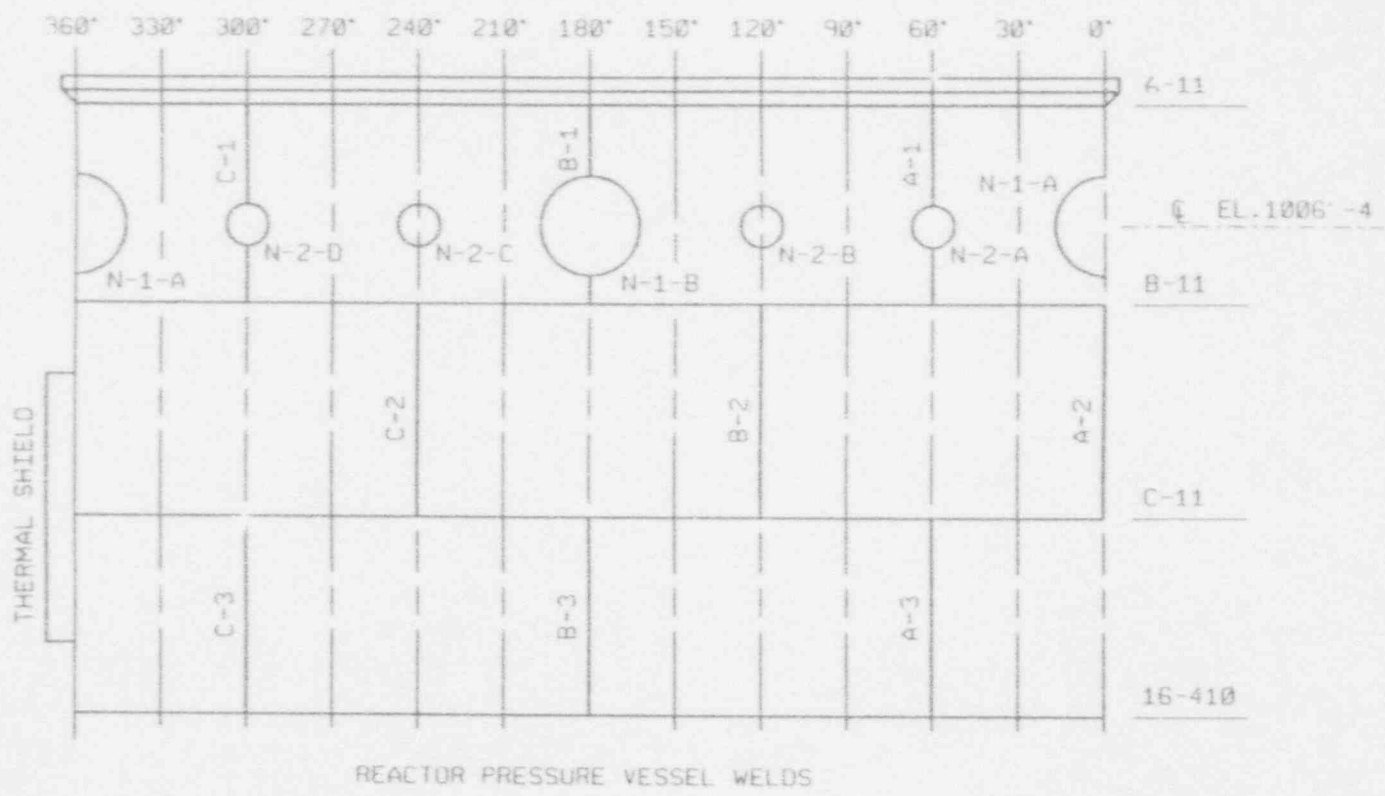


W. G. Gates
Vice President

WGG/tcm

Attachment

c: LeBoeuf, Lamb, Greene & MacRae
L. J. Callan, NRC Regional Administrator, Region IV
R. P. Mullikin, NRC Senior Resident Inspector
S. D. Bloom, NRC Project Manager



REACTOR PRESSURE VESSEL WELDS

CALIBRATION BLOCKS:

- 2 - FCL
- 5 - FCL
- 7 - FCL
- 8 - FCL

RPV-N1-1 (VESSEL INTERIOR)
RPV-N3-CSS-1 (CORE SUPPORT STRUCTURE)

DATE	TASK/NO

CONTAINMENT

REF. DWGS.
E-232-403-5

FORT CALHOUN STATION	
I.S.I. ISOMETRIC	
A-1	
DWG. FIGURE A-1, SH 1 OF 1	REV. SH. 27274

APPENDIX G

AUTOMATED ULTRASONIC EXAMINATION AREA LIMITATIONS FOR FORT CALHOUN STATION REACTOR PRESSURE VESSEL

This appendix describes the ultrasonic examination coverage obtained and examination limitations encountered during the 1992 inservice examination (ISI) of the Fort Calhoun Station reactor pressure vessel (RPV). The examination was performed by SwRI personnel using automated ultrasonic (AUT) scanning equipment and AUT data recording and analysis systems in accordance with a Scan Plan and procedures, approved by Omaha Public Power District, which complied with requirements of the 1980 Edition of American Society of Mechanical Engineers (ASME) Section XI with Addenda through Winter 1980 and NRC Regulatory Guide 1.150, Revision 1, Appendix A.

The scope of the AUT examinations included 100 percent of the accessible weld lengths of the RPV shell welds, nozzle welds, and selected areas of the nozzle, nozzle-to-safe end, and safe end-to-pipe welds. The examination coverage obtained was compared to the weld and base metal volumes identified as the examination areas in Section XI, IWB-3500 figures. The ASME Code-specified techniques for RPV examination were augmented by special, SwRI qualified techniques to obtain complete and highly sensitive coverage of the underclad and near-surface material volumes.

The surveillance tube holders, the outlet nozzle integral extensions, the flange taper, the flow skirt, the flow skirt support lugs, the core barrel support lugs, and material acoustic property differences limited scanning accessibility to the full length and/or width of some areas from the inside surface.

Examination coverage tables in this appendix quantify the volume of material examined with each ultrasonic technique for each examination area. The tables also describe the specific examination limitations applicable to each area and are cross-referenced to the examination summary record sheet numbers. The examination coverage Figures 1 through 10 graphically depict the examination limitations and are cross-referenced to the applicable areas in the tables.

000600	RPV-SL-A-2 Beltline Longitudinal Weld @ 0 deg.	45	CW	75.00	None	
		60	CW	75.00		
		0	CW	75.00		
		50/70	CW	25.00		
		combined		100.00		
		45	CCW	75.00		
		60	CCW	75.00		
		0	CCW	75.00		
		50/70	CCW	25.00		
		combined		100.00		
		45	UP	75.00		
		60	UP	75.00		
		0	UP	75.00		
		50/70	UP	25.00		
		combined		100.00		
		45	DN	75.00		
		60	DN	75.00		
0	DN	75.00				
50/70	DN	25.00				
combined		100.00				
Summary Number	Exam Area Identification	Beam Angle	Beam Direction	Percent Coverage	Figure Coverage	Remarks
000700	RPV-SL-B-2 Beltline Longitudinal Weld @ 120 deg.	45	CW	75.00	None	
		60	CW	75.00		
		0	CW	75.00		
		50/70	CW	25.00		
		combined		100.00		
		45	CCW	75.00		
		60	CCW	75.00		
		0	CCW	75.00		
		50/70	CCW	25.00		
		combined		100.00		
		45	UP	75.00		
		60	UP	75.00		
		0	UP	75.00		
		50/70	UP	25.00		
		combined		100.00		
		45	DN	75.00		
		60	DN	75.00		
0	DN	75.00				
50/70	DN	25.00				
combined		100.00				
000800	RPV-SL-C-2 Beltline Longitudinal Weld @ 240 deg.	45	CW	75.00	1 & 4	CW parallel examination limited due to proximity of the surveillance tube holder @ 225 deg.
		60	CW	74.92		
		0	CW	75.00		
		50/70	CW	25.00		
		combined		100.00		
		45	CCW	75.00		
		60	CCW	75.00		
		0	CCW	75.00		
		50/70	CCW	25.00		
		combined		100.00		
		45	UP	75.00		
		60	UP	75.00		
		0	UP	75.00		
		50/70	UP	25.00		
		combined		100.00		
		45	DN	75.00		
		60	DN	75.00		
0	DN	75.00				
50/70	DN	25.00				
combined		100.00				

Summary Number	Exam Area Identification	Beam Angle	Beam Direction	Percent Coverage	Figure Coverage	Remarks
001100	RPV-SL-C-3 Lower Shell Longitudinal Weld @ 300 deg.	45	CW	63.13	1 & 5	Parallel and transverse examinations limited due to the proximity of the flow skirt support lugs.
		60	CW	63.13		
		0	CW	63.13		
		50/70	CW	21.04		
		combined		84.27		
		45	CCW	63.13		
		60	CCW	63.13		
		0	CCW	63.13		
		50/70	CCW	21.04		
		combined		84.27		
		45	UP	63.20		
		60	UP	61.48		
		0	UP	67.52		
		50/70	UP	20.58		
		combined		83.78		
		45	DN	68.38		
		60	DN	70.30		
0	DN	64.87				
50/70	DN	22.07				
combined		92.37				
Summary Number	Exam Area Identification	Beam Angle	Beam Direction	Percent Coverage	Figure Coverage	Remarks
000900	RPV-SL-A-3 Lower Shell Longitudinal Weld @ 60 deg.	45	CW	63.13	1 & 5	Parallel and transverse examinations limited due to the proximity of the flow skirt support lugs.
		60	CW	63.13		
		0	CW	63.13		
		50/70	CW	21.04		
		combined		84.27		
		45	CCW	63.13		
		60	CCW	63.13		
		0	CCW	63.13		
		50/70	CCW	21.04		
		combined		84.27		
		45	UP	63.20		
		60	UP	61.48		
		0	UP	67.52		
		50/70	UP	20.58		
		combined		83.78		
		45	DN	68.38		
		60	DN	70.30		
0	DN	64.87				
50/70	DN	22.07				
combined		92.37				
001000	RPV-SL-B-3 Lower Shell Longitudinal Weld @ 180 deg.	45	CW	63.13	1 & 5	Parallel and transverse examinations limited due to the proximity of the flow skirt support lugs.
		60	CW	63.13		
		0	CW	63.13		
		50/70	CW	21.04		
		combined		84.27		
		45	CCW	63.13		
		60	CCW	63.13		
		0	CCW	63.13		
		50/70	CCW	21.04		
		combined		84.27		
		45	UP	63.20		
		60	UP	61.48		
		0	UP	67.52		
		50/70	UP	20.58		
		combined		83.78		
		45	DN	68.38		
		60	DN	70.30		
0	DN	64.87				
50/70	DN	22.07				
combined		92.37				

000200	RPV-SC-C-11	45	CW	60.83	1	Parallel and transverse examinations limited due to proximity of the surveillance tube holders.
	Lower Shell	60	CW	60.83		
	-to-	0	CW	60.83		
	Middle Shell (Battline Circ)	50/70	CW	20.28		
		combined		81.11		
		45	CCW	60.83		
		60	CCW	60.83		
		0	CCW	60.83		
		50/70	CCW	20.28		
		combined		81.11		
		45	UP	60.26		
		60	UP	60.26		
		0	UP	60.26		
		50/70	UP	20.09		
		combined		80.35		
		45	DN	60.26		
		60	DN	60.26		
	0	DN	60.26			
	50/70	DN	20.09			
	combined		80.35			

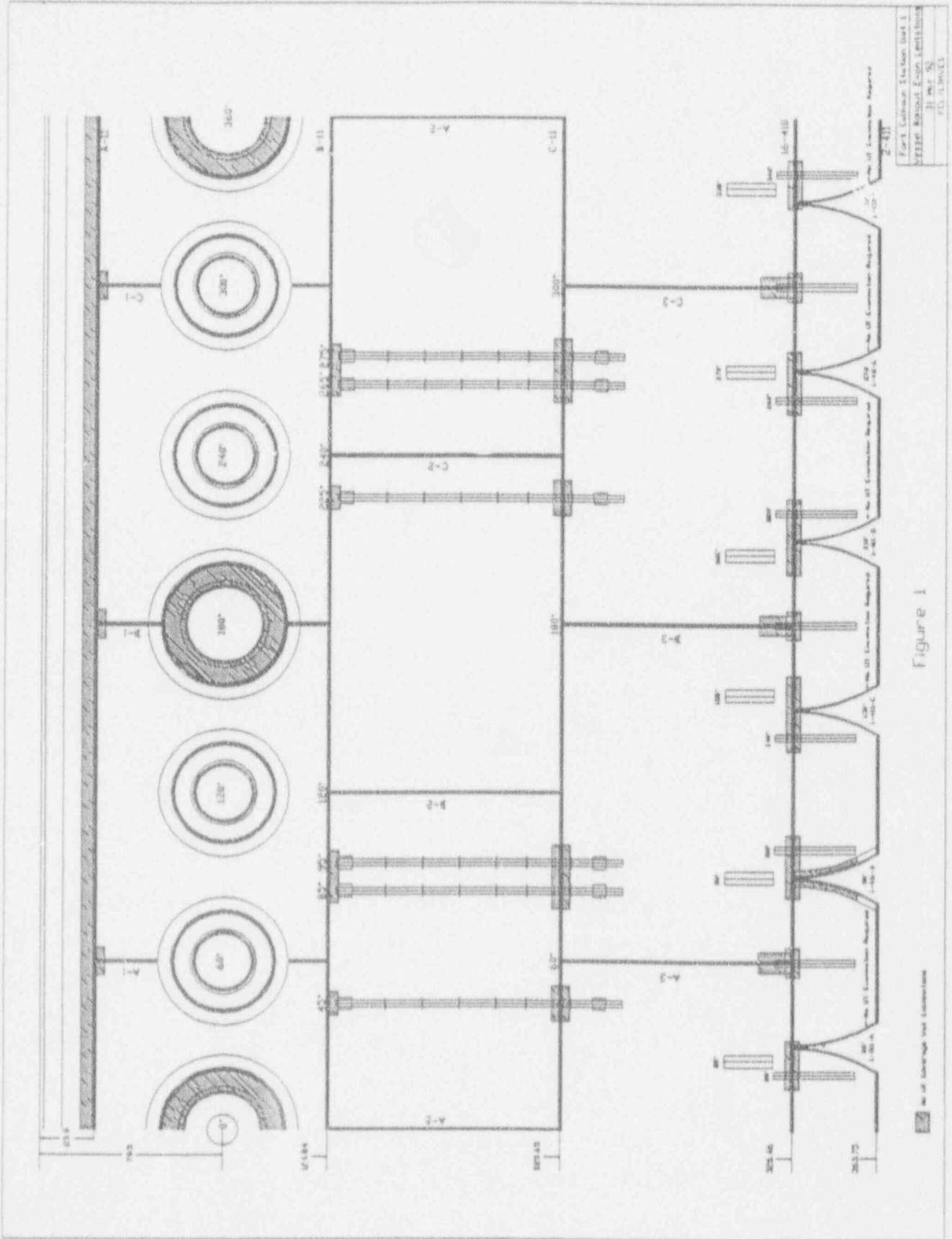
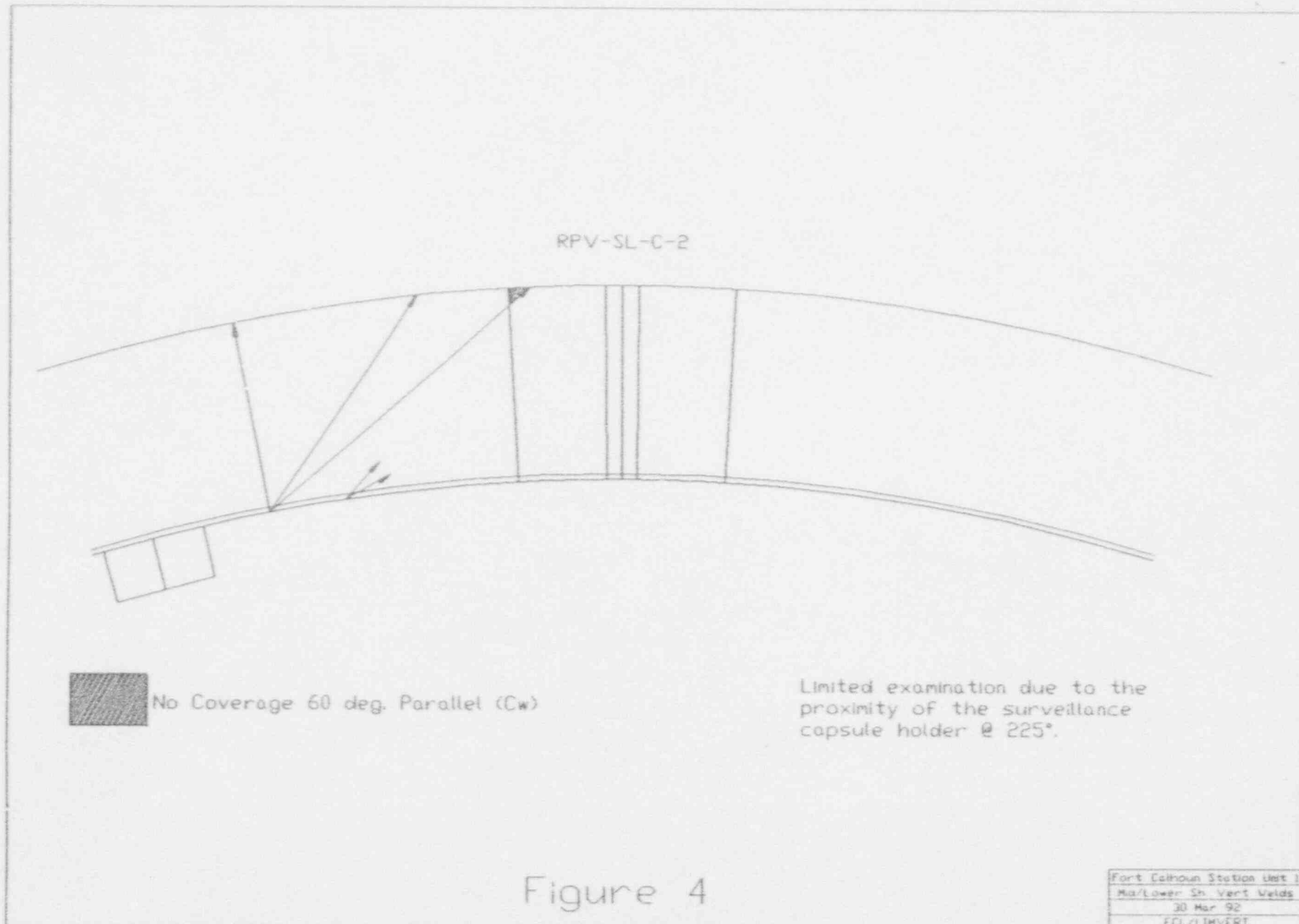
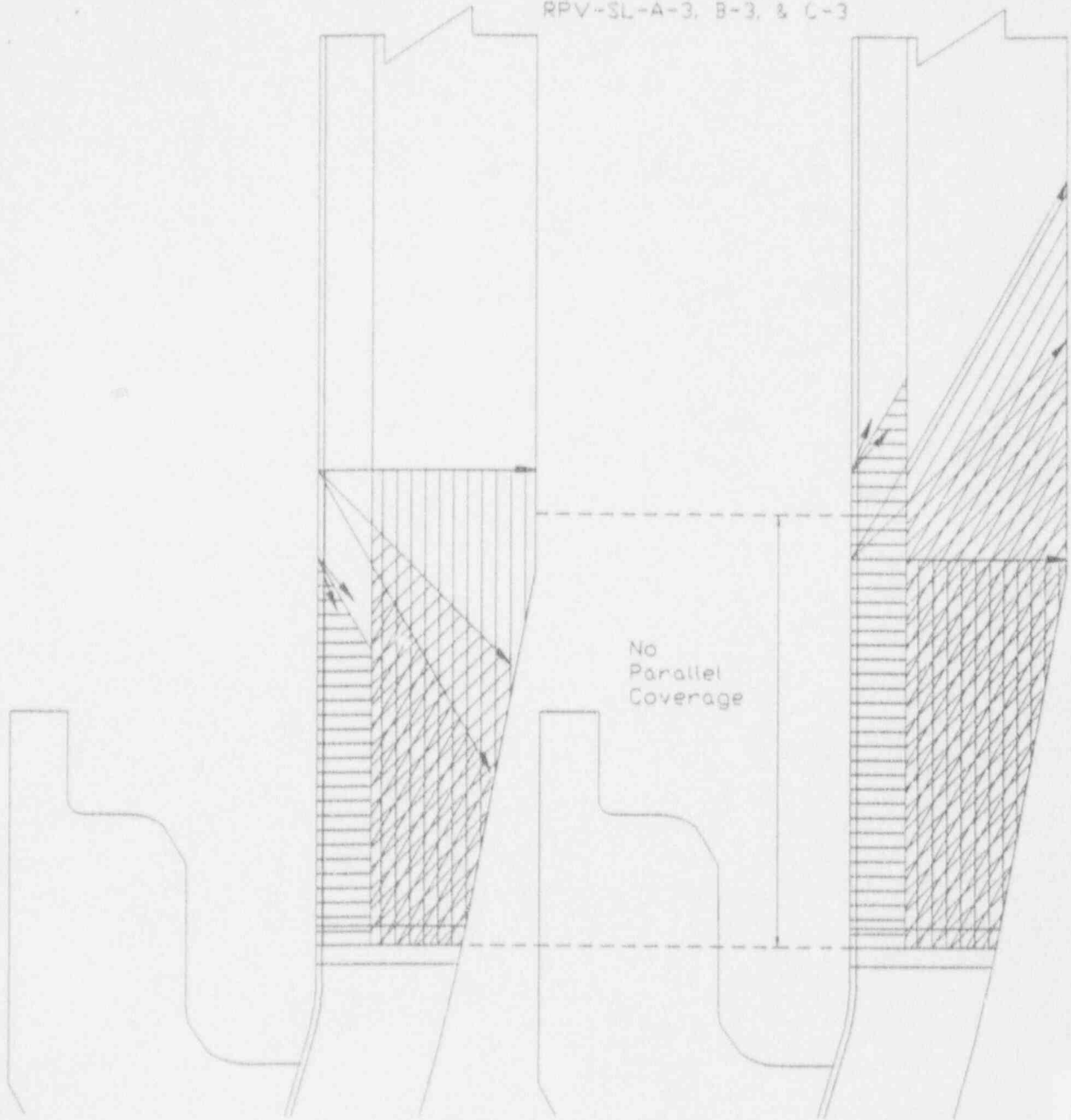


Figure 1



RPV-SL-A-3, B-3, & C-3



Limited examination due to the proximity of the flow skirt support lugs.



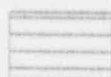
No Coverage 45 Transverse



No Coverage 0 Transverse



No Coverage 60 Transverse



No Coverage 50/70 Transverse

Figure 5

Fort Calhoun Station Unit 1
Lower Shell Vertical Welds
30 Mar 92
FCL/LIMLWVER