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SOUTHERN COMPANY
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January 10, 1997

Docket No.: 50-364

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Joseph M. Farley Nuclear Plant - Unit 2
Tube Pull Eddy Current Analysis

Ladies and Gentlemen:

During the Fall '96 refueling outage on Farley Unit 2, five tubes were pulled from the steam generators in order to gather additional information on steam generator degradation. During discussions with the NRC Staff, a request was made that "blind" degradation analyses for the steam generator tubes be docketed prior to the destructive examination of the steam generator tubes.

In accordance with the Staff's request, the requested "blind" analyses are attached.

If there are any questions, please contact me.

Respectfully submitted,

DM Morey

Dave Morey

REM/clt:TUBEPULL.DOC

Attachment

cc: Mr. L. A. Reyes, Region II Administrator
Mr. J. I. Zimmerman, NRR Project Manager
Mr. T. M. Ross, Plant Sr. Resident Inspector
Mr. T. A. Reed, NRR - Materials and Chemical Engineering Branch

A001

Attachment

"Blind" NDE Analyses for Farley-2 '96 Pulled Tubes

"Blind" NDE Analyses for Farley-2 '96 Pulled Tubes

Five tubes were pulled from Farley-2 SGs in November, 1996 at the EOC-11 outage. The tubes pulled and the type of degradation are identified in Table 1. Table 1 also summarizes the in situ test results for these indications. This note summarizes the NDE analyses performed for each tube prior to the destructive examination. Consequently, these analyses can be considered to be "blind" NDE analyses. The NDE analyses are summarized in Table 2 for R34C53 with ODSCC at the TSP intersections, Table 3 for R16C57, R12C39 and R14C48 with axial PWSCC at the hardroll expansion transition and Table 4 for R18C42 with circumferential ODSCC at the hardroll expansion transition. Attached figures for each indication include RPC C-scans, plots of depth profiles and UT crack maps. Depth profiling for the indications was performed by two NDE analysts. Analyst 1 is a very experienced senior analyst with significant experience in depth profiling. Analyst 2 is a field Level III analyst with limited training and experience in depth profiling. In general, the agreement between the two blind analyses, performed with no exchange of information between analysts, is good.

NDE Analyses for R34C53

Tube R34C53 with a 6.8 volt indication at TSP 1 was pulled to provide data for support of the ARC for ODSCC at TSP intersections and to obtain further insight into the effects of prior plugged tube history on the crack morphology. This tube was plugged in 1990, deplugged in 1995 at EOC-10 and returned to service for Cycle 11. This indication showed a significantly higher growth rate than found for other indications in the EOC-11 inspection including other tubes deplugged at EOC-10 and returned to service for Cycle 11. The bobbin voltage increased from 1.9 to 6.8 volts over Cycle 11. Figures 1 to 4 provide the + Point C-scan, bobbin analysis and depth profile plots for this indication.

Results of RPC depth profiling analyses are given in Table 2 including analyses of the RPC data from the '90 and '95 inspections. The '96 indication shows a length of about 0.65" with maximum and average depths of about 92% and 70%. The 80 mil and 100 mil pancake coil data provide the best basis for comparisons of changes in the crack profile from '90 to '96. After deplugging in '95, the crack length shows a very small increase compared to '90 data (about 0.04") with no quantifiable difference in maximum or average depths. The implied growth while plugged from '90 to '95 shows the typical voltage increase for plugged tubes with modest implied increase in length and depth. These RPC results would imply negligible growth over the last operating cycle from '95 to '96. An implied growth increase is seen only in the bobbin and RPC voltages. This could indicate an increased separation of the crack faces such as could occur with IGA growth on the crack faces as indicated by prior destructive examinations of tubes previously plugged for indications at TSP intersections including the '90 Farley-2 tube R21C22.

NDE Analyses for R16C57 and R12C39

Tubes R16C57 and R12C39 were pulled for axial PWSCC in the roll expansion transition in support of development of an ARC for this degradation mode. By both + Point and

UT inspections, R16C57 has two detected cracks and R12C39 has three indications. Table 3 summarizes the NDE analyses for these tubes. Figures 5 to 11 provide RPC and UT results for R16C57 and Figures 12 to 18 provide results for R12C39. The NDE analyses indicate all indications to be near throughwall locally with average depths between about 60% and 88%. The principal differences between + Point or pancake coils and UT are in the predicted crack lengths with UT implying shorter lengths. The RPC results of Table 3 include adjustments for end effects as discussed below.

Guidelines for adjusting PWSCC crack lengths for coil lead-in and lead-out effects were developed as part of an effort to qualify depth sizing for axial PWSCC at dented TSP intersections. The resulting guidelines for reducing the crack length are based on the increase in phase angle found on both EDM notches and corrosion specimens at the ends of the crack. These guidelines are:

OD Phase Angles Near Ends of Crack

- Data points with OD phase angles from the start of OD to the end of the crack are ignored in defining the crack length as long as within 0.2" of the indicated end of the crack. The end of the crack shall be defined as ≤ 0.03" beyond the last accepted (without points with OD phase) data point if points are deleted at the end of the crack.

Near Throughwall ID Phase Angles Near Ends of Crack

- Near throughwall ID phase depths (≥ 85 %) with voltages < 1 volt are ignored in defining the crack length as long as within 0.2" of the indicated end of the crack. The end of the crack shall be defined as ≤ 0.03" beyond the last accepted data point if points are deleted at the end of the crack.

ID Depths Increase Near Ends of Crack

- If ID depths at points near the end of the crack show depth increases of > 10% over about 0.05" spans and voltages < 1 volt, the data points shall be ignored in defining the crack length as long as within 0.2" of the indicated end of the crack. The end of the crack shall be defined as ≤ 0.03" beyond the last accepted data point if points are deleted at the end of the crack.

The above guidelines were applied to the NDE analyses for the Farley-2 pulled tubes with the results given in Table 3 as an NDE modification for end effects. It is seen that the corrections reduce the crack lengths by up to 0.3" (R16C57-Crack 1 and R14C48-Crack 1) with the resulting lengths in closer agreement with the UT results. Corrections for the end effects also affect the maximum and average depths for the indications. For this reason, guidelines to eliminate the data points affected by the end effects are required rather than only a correction to the length.

<u>NDE Analyses for R14C48</u>

Tube R14C48 was pulled for axial . WSCC in the roll transition in support of an ARC with particular emphasis on assessing return to service of deplugged indications. This

tube was plugged in '90 and deplugged in the '96 inspection. Table 3 includes the NDE analyses for this tube. Figures 19 to 28 provide the RPC and UT results including depth profiles. Comparing the 80 and 100 mil pancake data between '90 and '96 for crack 1, the implied growth as a plugged indication is modest in length (about 0.15" increase), maximum depth (7% increase) and average depth (17% increase). However, the pancake coil voltage shows an increase from about 4.8 to 22.3 volts for the plugged tube period. The destructive exam may help to explain the voltage increase which is larger than expected for the changes in length and depth.

This indication provides a good comparison of coil resolution between the + Point, 80 mil and 115 mil coils as well as UT. Figures 19 to 23 show the three RPC C-scans and the UT crack map and response. It is seen in Figure 20 that the 80 mil coil clearly resolves the two closely spaced cracks as also seen by UT (Figures 22, 23). However, the second crack is not resovable with the + Point coil as shown in Figure 19. The second indication is identifiable with the 115 mil coil but not as well as the 80 mil coil. These results demonstrate the reduced resolution of the + Point coil due to the larger coil field for this coil.

NDE Analyses for R18C42

Tube R18C42 was pulled for a circumferential indication of about 290°. The NDE data are summarized in Table 4. Figures 29 to 34 show the RPC and UT data. The NDE results show a locally deep indication although the PDA (360° percent degraded area) is only about 40%. Voltage integral analyses using the Zectec EDDYNET95 software are also given in Table 4.

The UT results indicate that the overall circumferential indication is comprised of about 5 overlapping segments with apparent ligaments between the segments. UT also indicates the presence of a short, shallow axial indication (0.035" long, 45% deep) which does not quite intersect the circumferential segments. This axial indication was not identified in the + Point inspection.

Table 1. Farley-2: '96 Pulled Tubes and Type of Degradation

Axial Indication Tube Pulls

SG B: R12C39 - PWSCC axial (MAI with 3 sizable ind.) for ARC support. Establish crack morphology, NDE accuracy and support for in situ test results.
Indication did not leak during in situ test. Not pressure tested.
Tube cut just below 1st TSP.

R14C48 - Current outage, deplugged PWSCC axial for ARC support and understanding of causes for apparent growth in volts and length of deplugged tubes.
Indication did not leak during in situ test. Not pressure tested.
Tube cut just below 1st TSP.

SG C: R34C53 - TSP indication with large volts and deplugged at prior outage.
Exam to aid understanding of apparent larger growth in deplugged tubes and provide data to support ARC leak rate correlation. Delays need for another ARC tube pull for one cycle.
No in situ test performed on this tube.
Tube cut just below 4th TSP.

R16C57 - PWSCC axial (MAI with 2 sizable ind.) for ARC support. Establish crack morphology, NDE accuracy and support for in situ test results.
Indication did not leak or burst during in situ pressure testing.
Tube cut just below 1st TSP.

Circumferential Indication Tube Pull

SG C: R18C42 - Largest circumferential indication in terms of voltage, maximum depth and crack angle for all SGs.
Indication did not leak or burst during in situ testing and, therefore, satisfies structural integrity.
Objectives for tube pull are to obtain burst capability of the indication, provide data for comparison of length/depth sizing predictions with destructive exam data, confirm crack morphology for comparisons with other industry data to reduce need for future tube pulls based on use of industry wide experience for NDE analyses and obtain information on chemistry environment for assessing operational chemistry.
Tube cut just below 1st TSP.

Table 2. Farley-2 '96 Pulled Tubes: NDE Analyses for Axial ODSCC at TSP Intersections													
Tube	Elev.	NDE Date	Bobbin Coil					Detailed Sizing Analyses					
			Field Volts	Lab. Volts	Cross Cal. Factor	Corr. Lab. Volts	Depth	Coil	Analyst	Length	Max. Depth	Avg. Depth	P-P Max. Volts
R34C53 SG C Deplugged in '95 at EOC-10 Operated in Cycle 11 Plugged in '90	1H	'96	6.73[1]	7.03	0.967	6.80	89%	+ Point	A1	0.65	92%	70%	4.54
									A2	0.74	87%	63%	4.62
								80 mil HF	A1	0.52	91%	68%	6.49
		'95	1.89	1.93	1.007	1.94	88%	100 mil MR	A1	0.48	89%	74%	2.29
		'90	1.4	1.28	No Std.		80%	100 mil MR	A1	0.39	82%	62%	1.16
	2H	'96	NDD					Not Inspected					
	3H	'96	NDD					Not Inspected					

Notes:
1. Voltages for field analyses include cross calibration of field ASME standard to the reference laboratory standard.

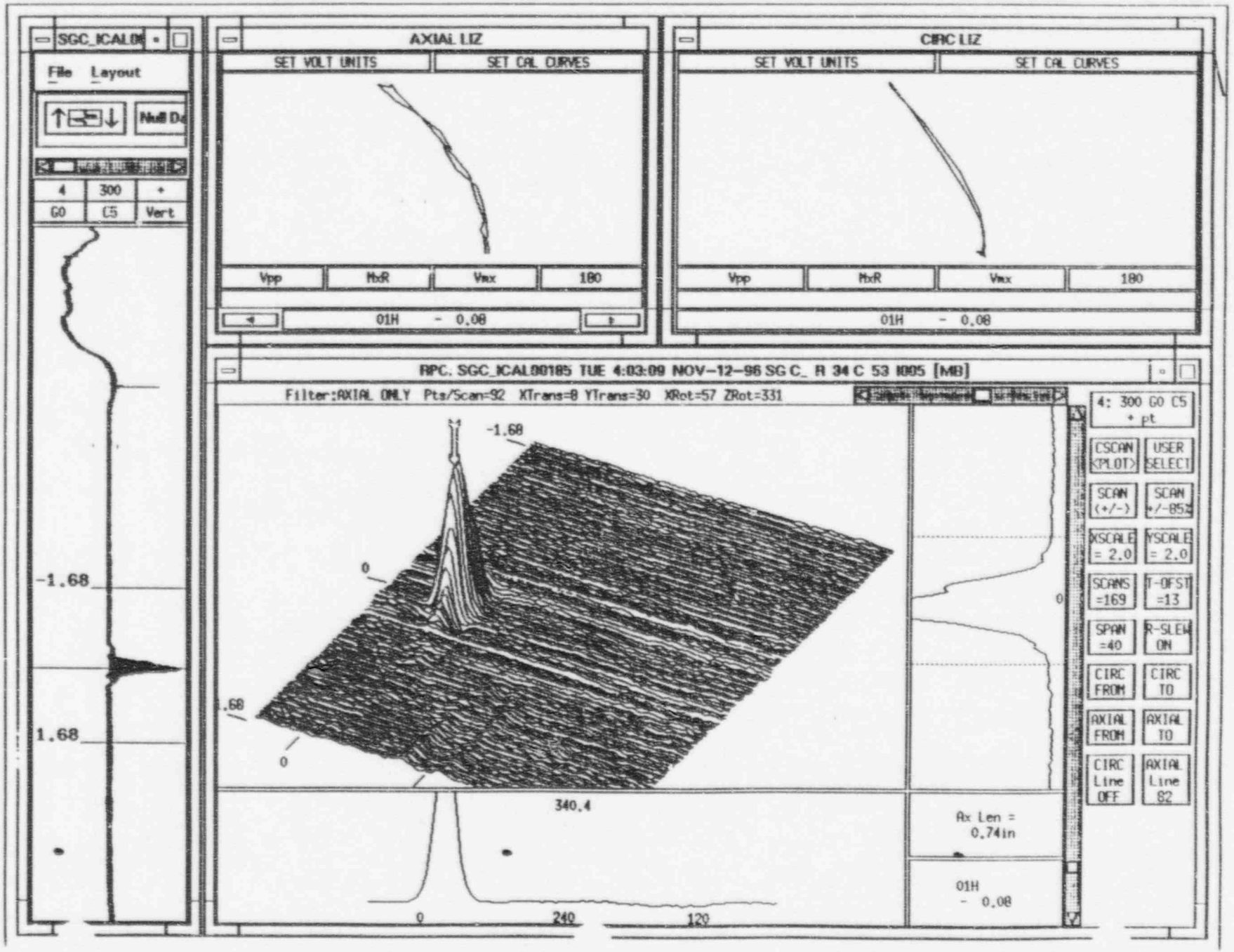
Table 3. Farley-2 '96 Pulled Tubes: NDE Analyses for Axial PWSCC at Hardroll Expansion Transitions									
Tube	NDE Date	Detailed Sizing Analyses							
		Crack No.	Coil	Analyst	NDE Mod.	Length (inch)	Max. Depth	Avg. Depth	Max. Volts
R16C57 SG C Active tube up to 11/96 tube pull	'96	1	+ Point	A1	None	0.52	100%	79%	1.80
				A2	None	0.52	100%	83%	1.95
				A1	End Effects	0.24	100%	73%	1.80
				A2	End Effects	0.24	100%	80%	1.95
			UT	A3	None	0.18	100%	70%	-
		2	+ Point	A1	None	0.21	99%	75%	1.09
				A2	None	0.27	100%	69%	1.18
				A1	End effects	0.15	99%	85%	1.09
				A2	End Effects	0.17	100%	80%	1.18
			UT	A3	None	0.16	100%	69%	-

Table 3. Farley-2 '96 Pulled Tubes: NDE Analyses for Axial PWSCC at Hardroll Expansion Transitions									
Tube	NDE Date	Detailed Sizing Analyses							
		Crack No.	Coil	Analyst	NDE Mod.	Length (inch)	Max. Depth	Avg. Depth	Max. Volts
R12C39 SG B Active tube up to 11/96 tube pull	'96	1	+ Point	A1	None	0.31	100%	88%	1.29
				A2	None	0.26	100%	71%	1.46
				A1	End Effects	0.29	100%	88%	1.29
				A2	End Effects	0.24	100%	73%	1.46
			80 mil HF	A1	None	0.42	100%	73%	3.60
				A1	End Effects	0.18	100%	88%	3.60
			UT	A3	None	0.18	100%	65%	-
		2	+ Point	A1	None	0.19	100%	84%	0.78
				A2	None	0.22	100%	59%	0.66
				A1, A2	No End Effects				
			80 mil HF	A1	None	0.31	99%	68%	4.92
				A1	End Effects	0.21	97%	67%	4.92
			UT	A3	None	0.14	96%	73%	-
		3	+ Point	A1	None	0.15	100%	83%	0.39
				A2	None	0.18	98%	68%	0.41
				A1	No End Effects				
				A2	End Effects	0.14	98%	69%	0.41
			80 mil HF	A1	None	0.25	100%	80%	2.21
				A1	End Effects	0.19	100%	78%	2.21
			UT	A3	None	0.14	96%	62%	-

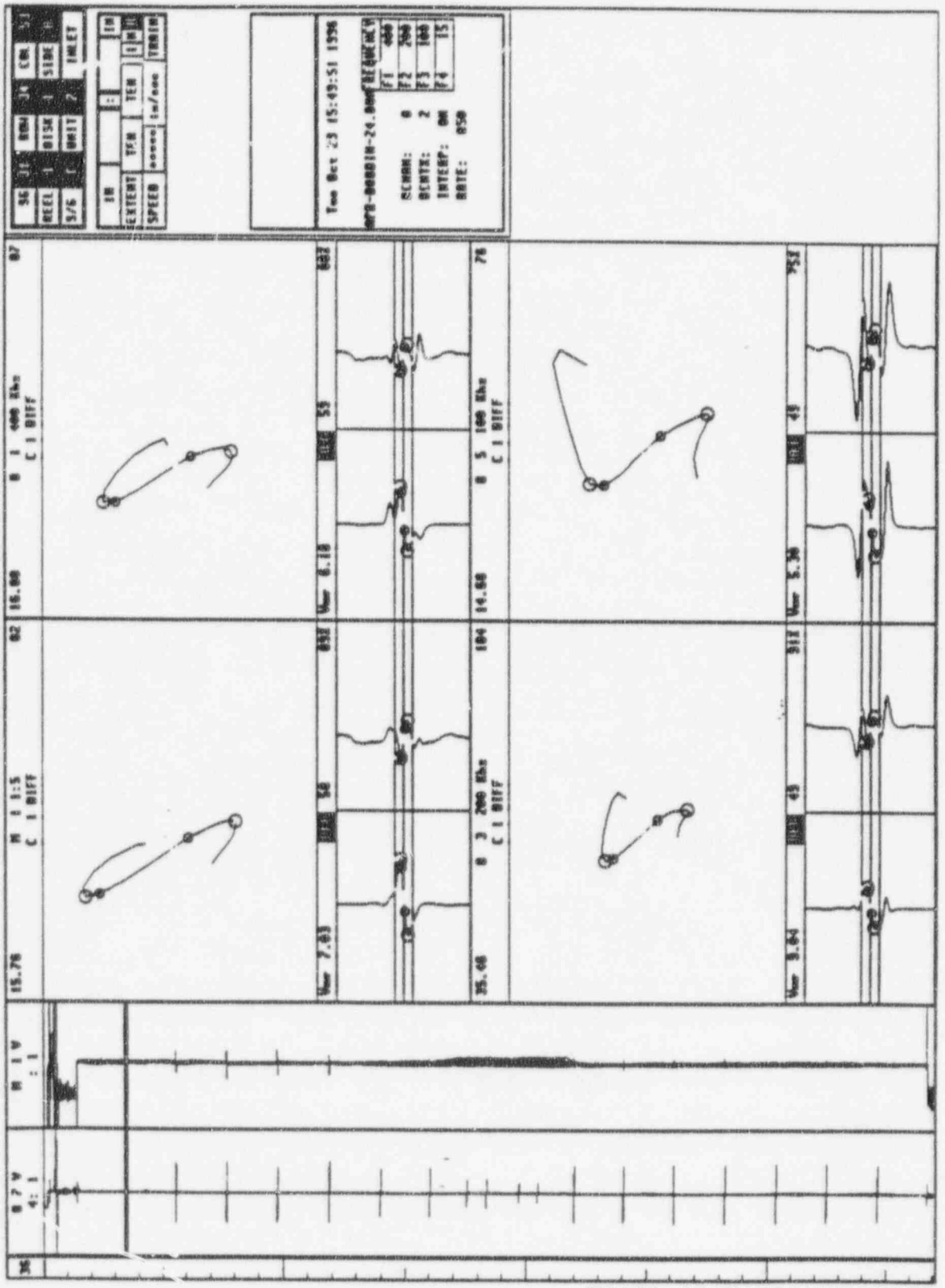
Table 3. Farley-2 '96 Pulled Tubes: NDE Analyses for Axial PWSCC at Hardroll Expansion Transitions									
Tube	NDE Date	Detailed Sizing Analyses							
		Crack No.	Coil	Analyst	NDE Mod.	Length (inch)	Max. Depth	Avg. Depth	Max. Volts
R14C48 SG B Deplugged in '96 Plugged in '90	'96	1	+ Point	A1	None	0.87	99%	83%	10.8
				A2	None	0.81	99%	83%	11.3
				A1	End Effects	0.55	99%	92%	10.8
				A2	End Effects	0.53	99%	91%	11.3
			80 mil HF	A1	None	0.56	96%	84%	22.3
				A1	End Effects	0.50	96%	86%	22.3
			UT	A3	None	0.40	100%	80%	-
	'90	1	100 mil MR	A1	None	0.39	89%	64%	4.83
				A1	End Effects	0.35	89%	69%	4.83
	'96	2	+ Point	Not Resolvable					
			80 mil HF	A1	None	0.36	100%	75%	6.32
				A1	End Effects	0.28	100%	85%	6.32
			UT	A3	None	0.18	100%	74%	-

Table 4. Farley-2 '96 Pulled Tubes: NDE Analyses for Circumferential ODSCC at Hardroll Expansion Transition										
Tube	**NDE Date**	**Detailed Sizing Analyses**							**Voltage Integral Multi-Scan**	
		Coil	**Analyst**	**NDE Mod.**	**Crack Angle**	**Max. Depth**	**Percent Degraded Area**	**P-P Max. Volts**	**Max. Volts**	**Avg. Volts**
R18C42 Active tube up to 11/96 tube pull	'96	+ Point	A1	None	285°	85%	39%	2.01	2.07	0.53
			A2	None	293°	83%	39%	2.58	2.12	0.59
			A1	20% Min. Depth	360°	85%	41%	2.01		
			A2	20% Min. Depth	360°	83%	44%	2.58		
		UT	A3	None	211° Envelope of five segments	100%	35%	-		
			A3	20% Min. Depth	360°	100%	45%	-		
			A3	None	0.1" Long Axial	45%	31%	-		

Figure 1
Farley Unit 2 - R34C53, SG C
+Point C-scan for TSP 1
'96 Inspection



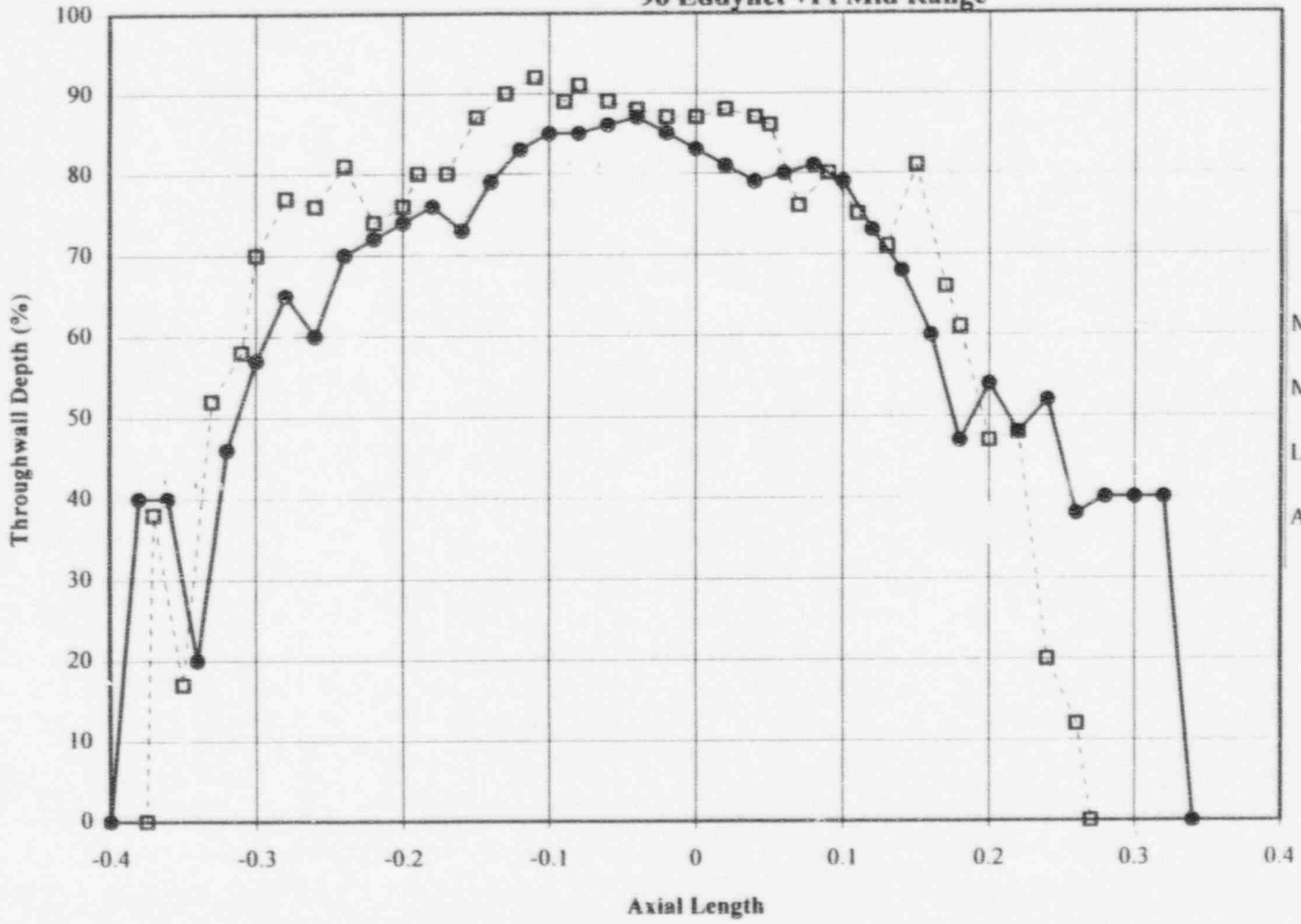
J.M. FARLEY_____ _10/29/96 INLET UNIT: 2 SG: C REEL: 1 RES



EC187 12/04/96 10:45:48

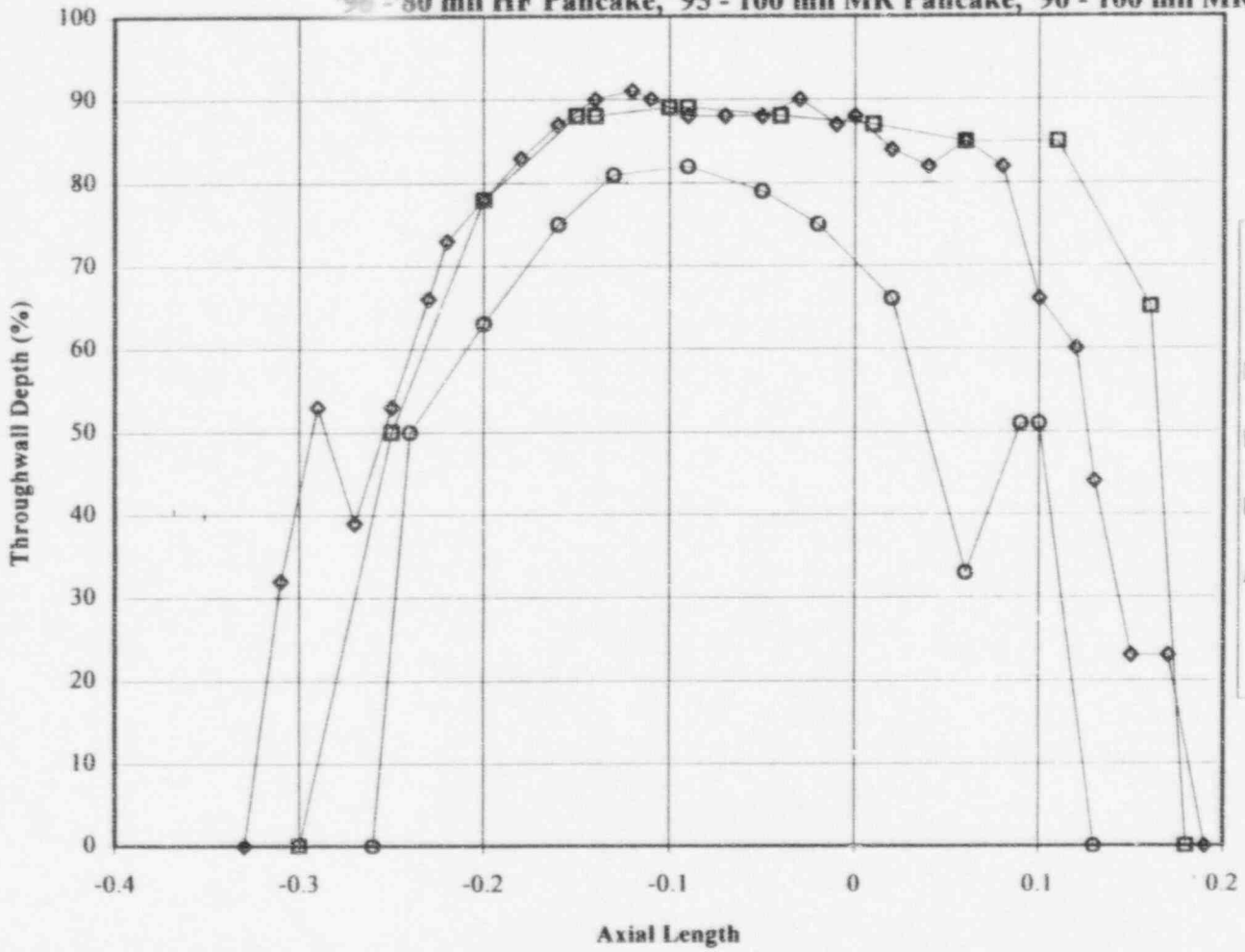
Figure 2
Farley Unit 2 - R34C53, SG C
Bobbin Coil Analysis
'96 Inspection

Figure 3
Farley Unit 2 - R34C53 SG/C - Crack 1
Axial Length vs. Throughwall Depth
'96 Eddynet +Pt Mid Range



	A1	A2
Max. Volts	4.54	4.62
Max. Depth (%)	92	87
Length	.65	.74
Avg. Depth(%)	70.4	62.9

Figure 4
Farley Unit 2 - R34C53 SG/C - Crack 1
Axial Length vs. Throughwall Depth
'96 -'80 mil HF Pancake, '95 - 100 mil MR Pancake, '90 - 100 mil MR Pancake



	A1 '96	A1 '95	A1 '90
Max. Volts	6.49	2.29	1.16
Max. Depth (%)	91	89	82
Length	.52	.48	.39
Avg. Depth(%)	67.8	74.3	61.5

Figure 5
Farley Unit 2 - R16C57, SG C
+Point C-scan for Roll Transition
'96 Inspection

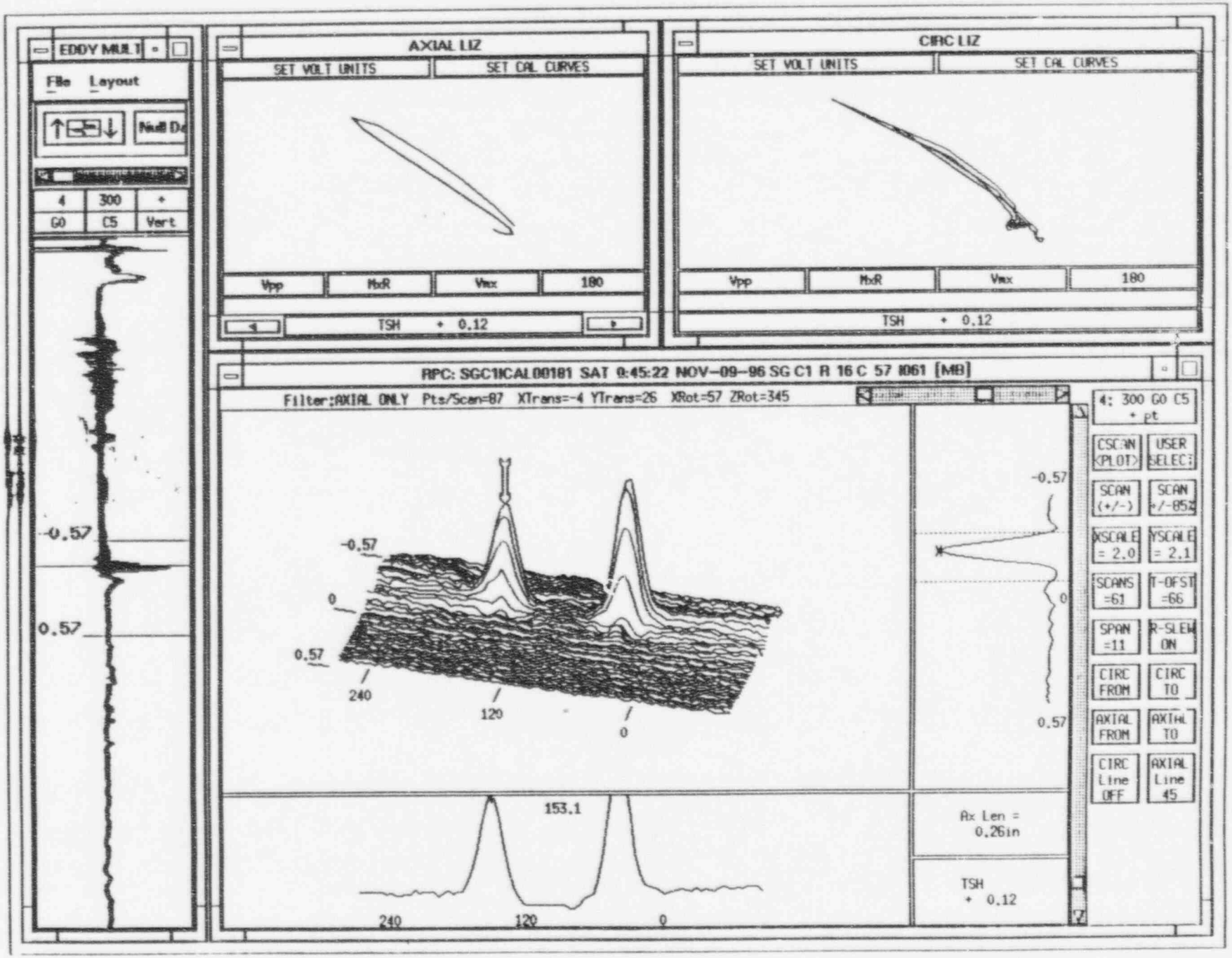
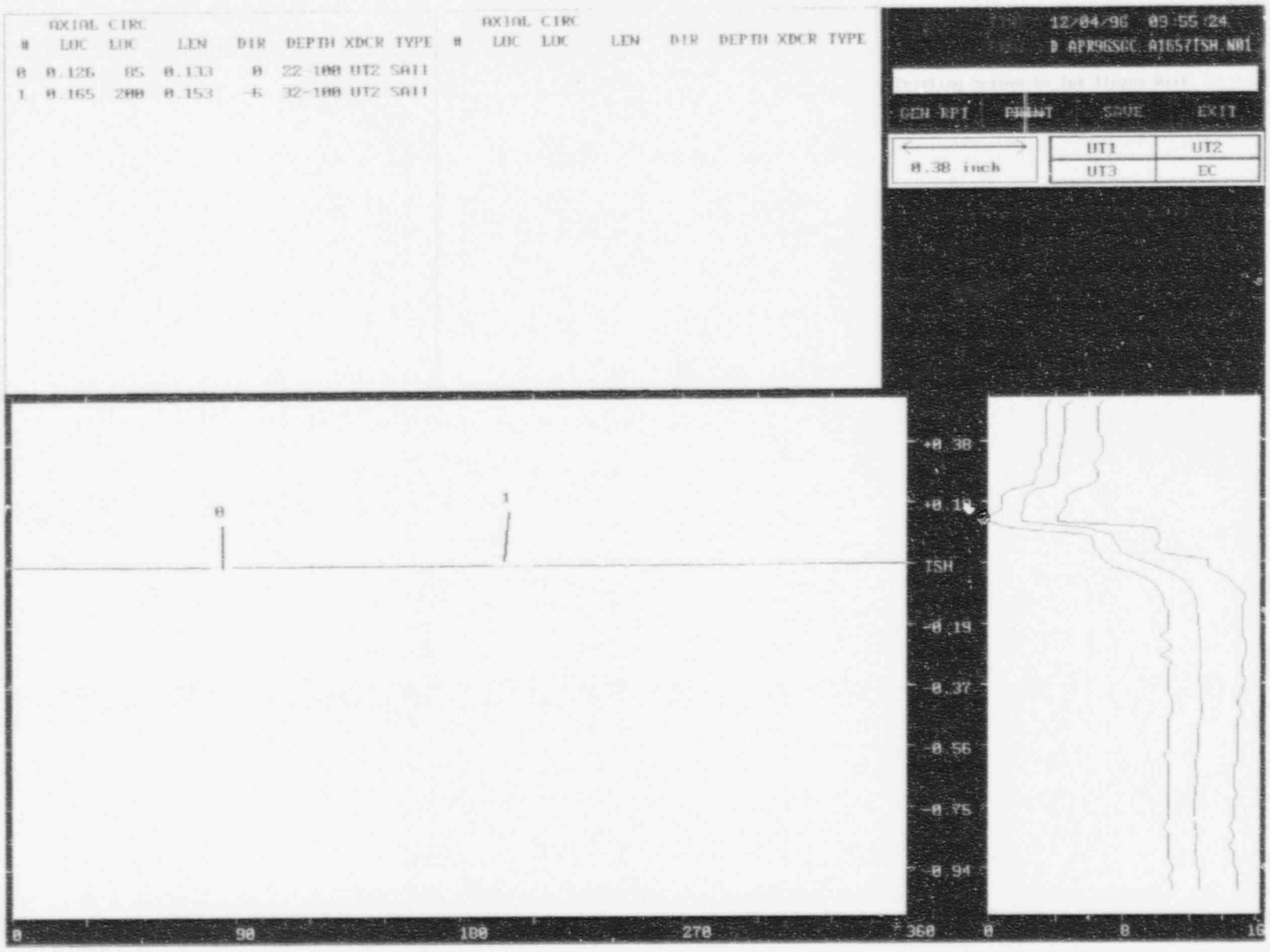


Figure 6
Farley Unit 2 - R16C57, SGC
UT Crack Map for Roll Transition

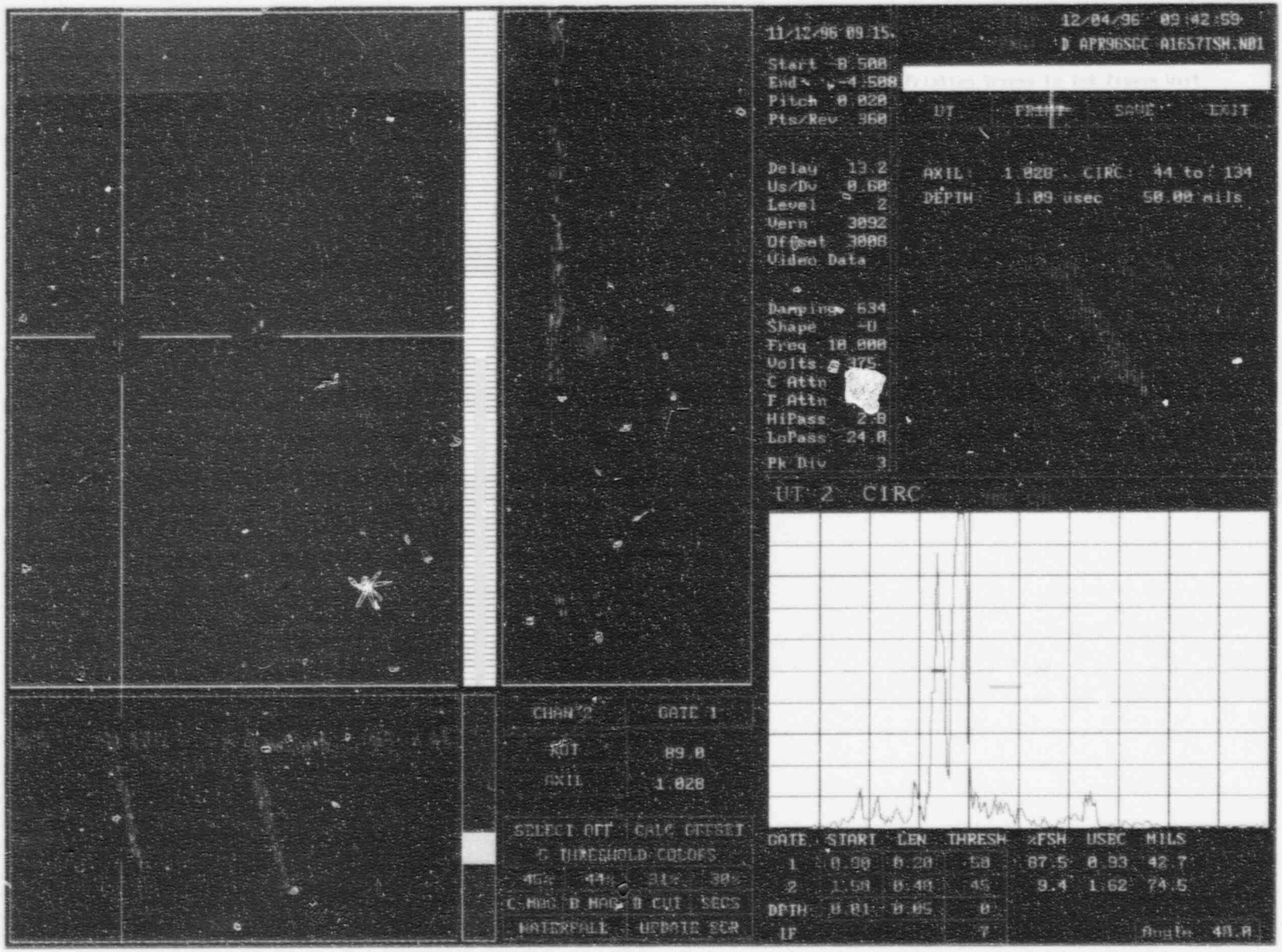


WESTINGHOUSE ELECTRIC CORPORATION - NSD - NDE

CUSTOMER: SOUTHERN NUCLEAR
SITE: FARLEY
OUTAGE: U2R11

ALPHA: APR UNIT: 2 GEN: C LEG: H
FILE: APR96SGC A165ZTSH.N01

Figure 7
Farley Unit 2 - R16C57, SG C
UT Response for Roll Transition

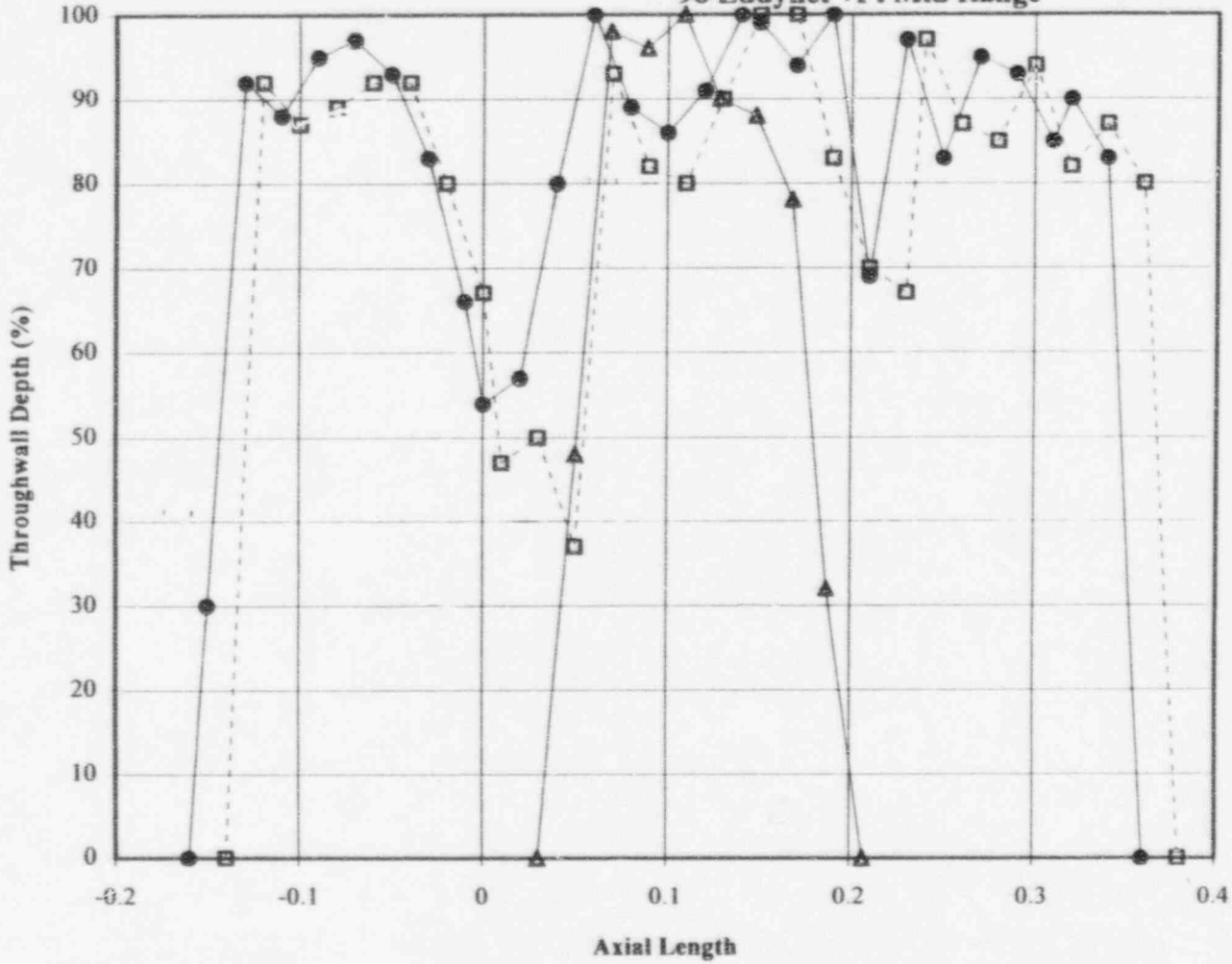


WESTINGHOUSE ELECTRIC CORPORATION - NSD - NDE

CUSTOMER: SOUTHERN NUCLEAR
SITE: FARLEY
OUTAGE: U2R11

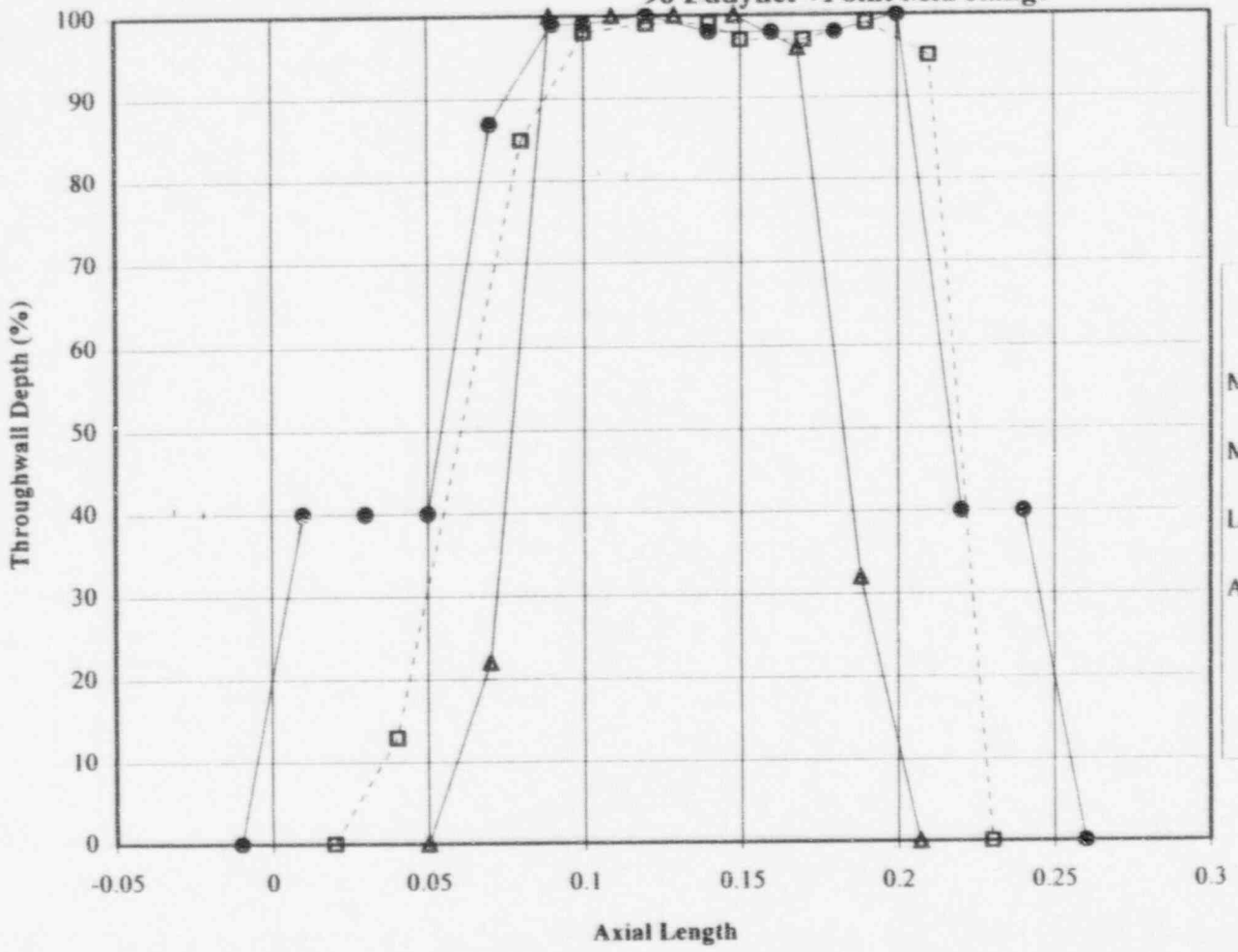
ALPHA: APR UNIT: 2 GEN: C LEG: H
FILE: APR96SGC A1657TSH.N01

Figure 8
Farley Unit 2 - R16C57 SG/C - Crack 1
Axial Length vs. Throughwall Depth
'96 Eddynet +Pt Mid Range



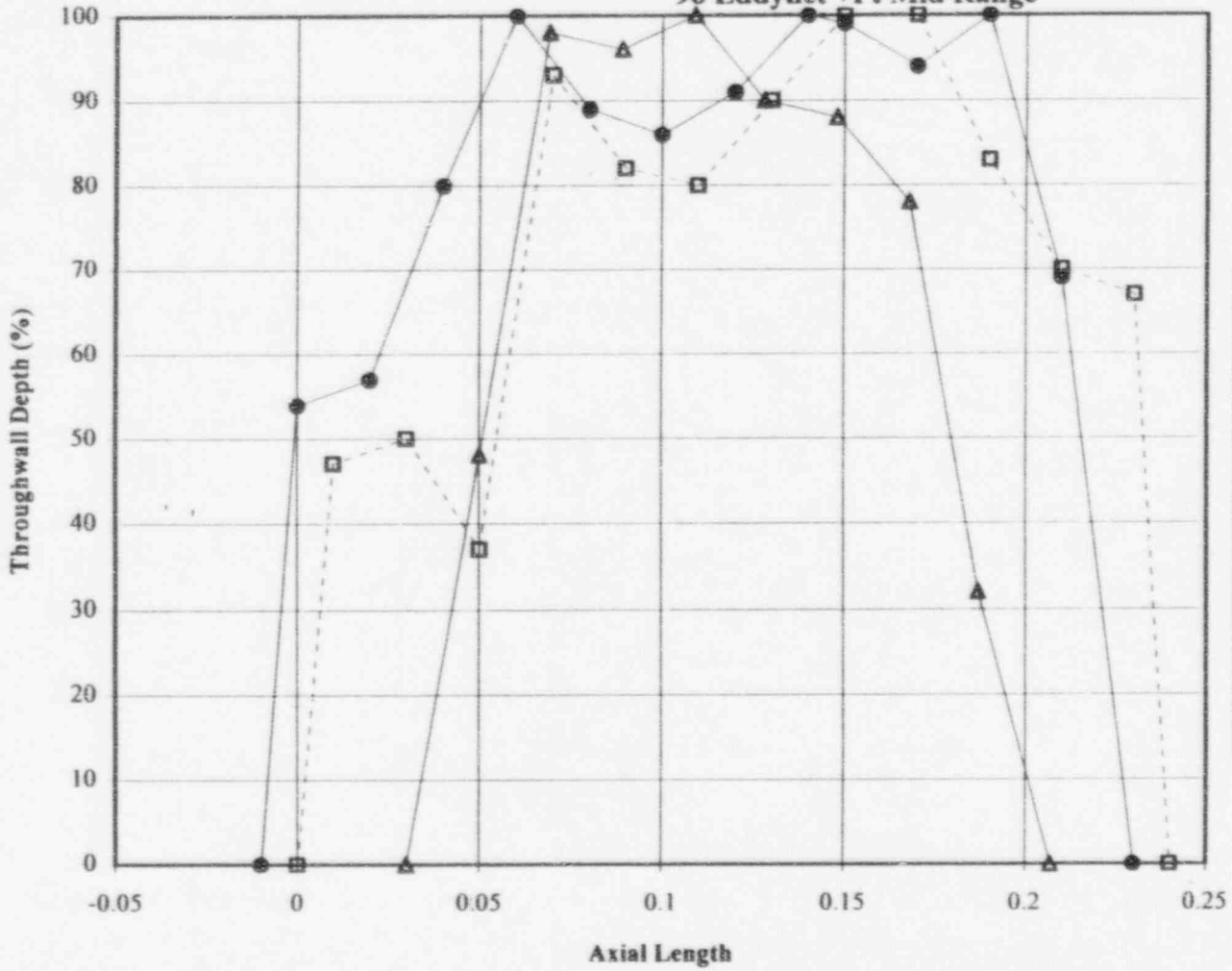
	A1	A2	A3
Max. Volts	1.80	1.95	--
Max. Depth (%)	100	100	100
Length	.52	.52	.177
Avg. Depth(%)	78.5	83.0	69.9

Figure 9
Farley Unit 2 - R16C57 SG/C - Crack 2
Axial Length vs. Throughwall Depth
'96 Eddynet +Point Mid Range



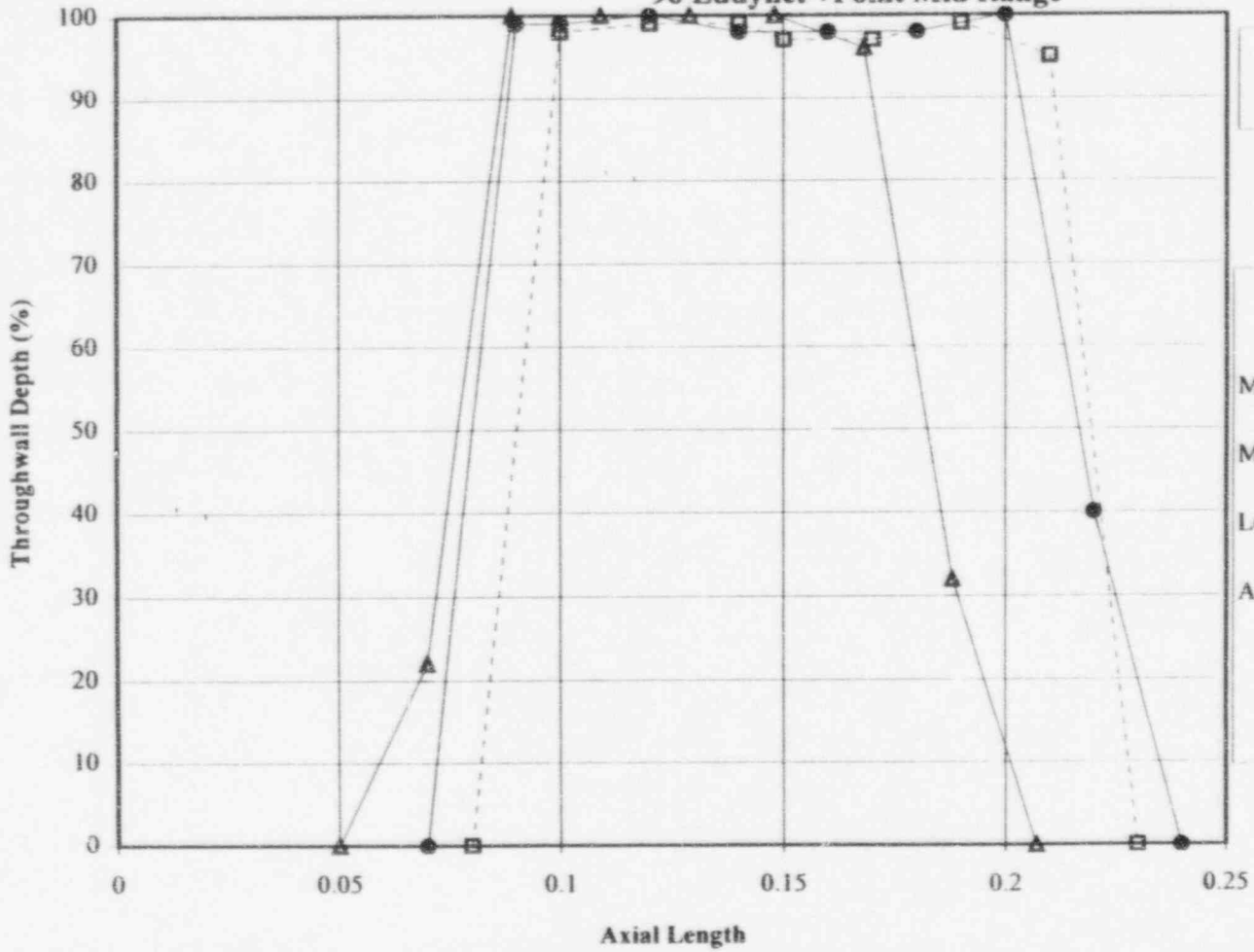
	A1	A2	A3
Max. Volts	1.09	1.18	--
Max. Depth (%)	99	100	100
Length	.21	.27	.157
Avg. Depth(%)	74.5	68.9	68.9

Figure 10
Farley Unit 2 - R16C57 SG/C - Crack 1 - Length Adjusted
Axial Length vs. Throughwall Depth
'96 Eddynet +Pt Mid Range



	A1	A2	A3
Max. Volts	1.80	1.95	--
Max. Depth (%)	100	100	100
Length	.24	.24	.177
Avg. Depth(%)	72.5	79.7	69.9

Figure 11
Farley Unit 2 - R16C57 SG/C - Crack 2 - Length Adjusted
Axial Length vs. Throughwall Depth
'96 Eddynet +Point Mid Range



	A1	A2	A3
Max. Volts	1.09	1.18	--
Max. Depth (%)	99	100	100
Length	.15	.17	.157
Avg. Depth(%)	84.7	80.3	68.9

Figure 12
Farley Unit 2 - R12C39, SG B
+Point C-scan for Roll Transition

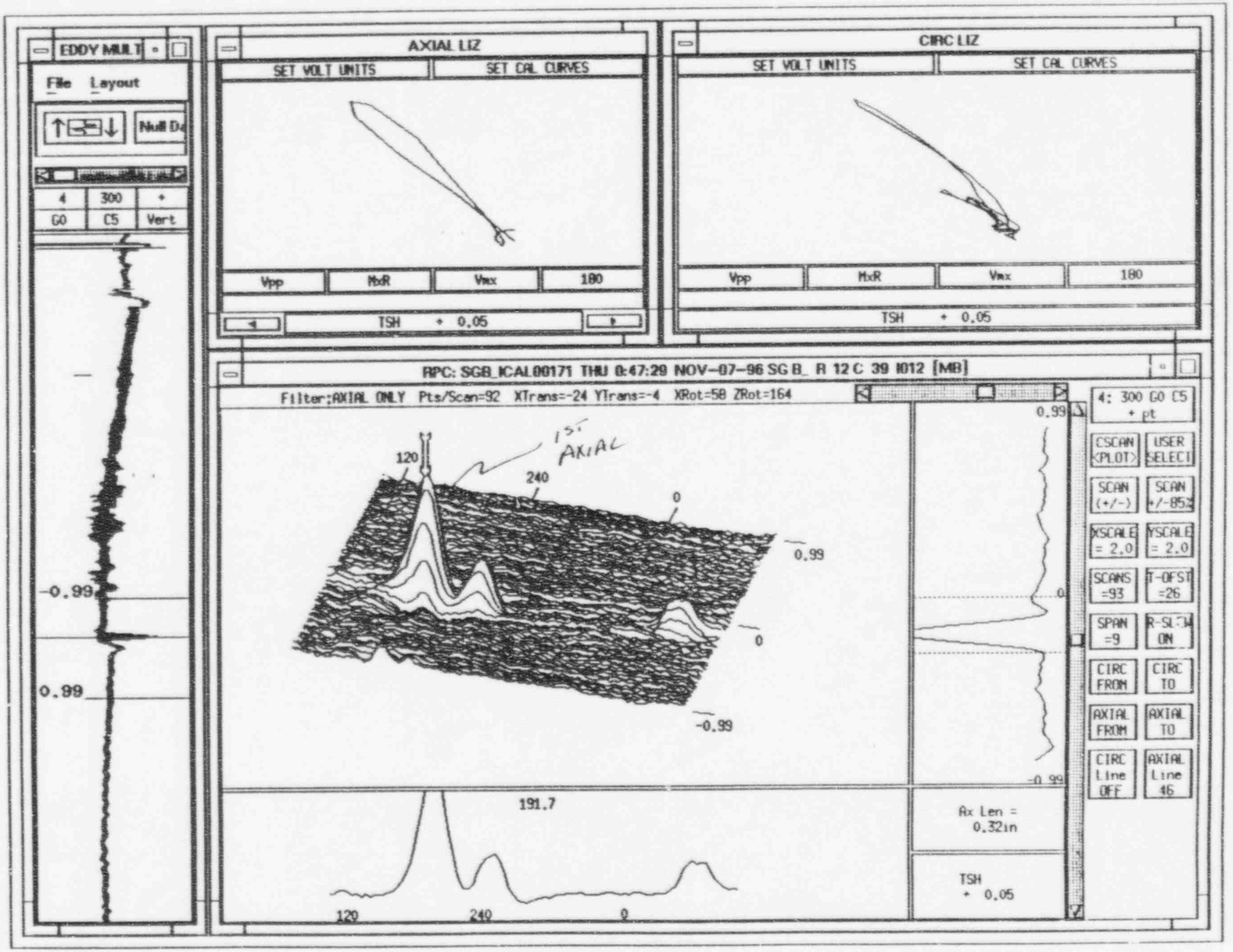
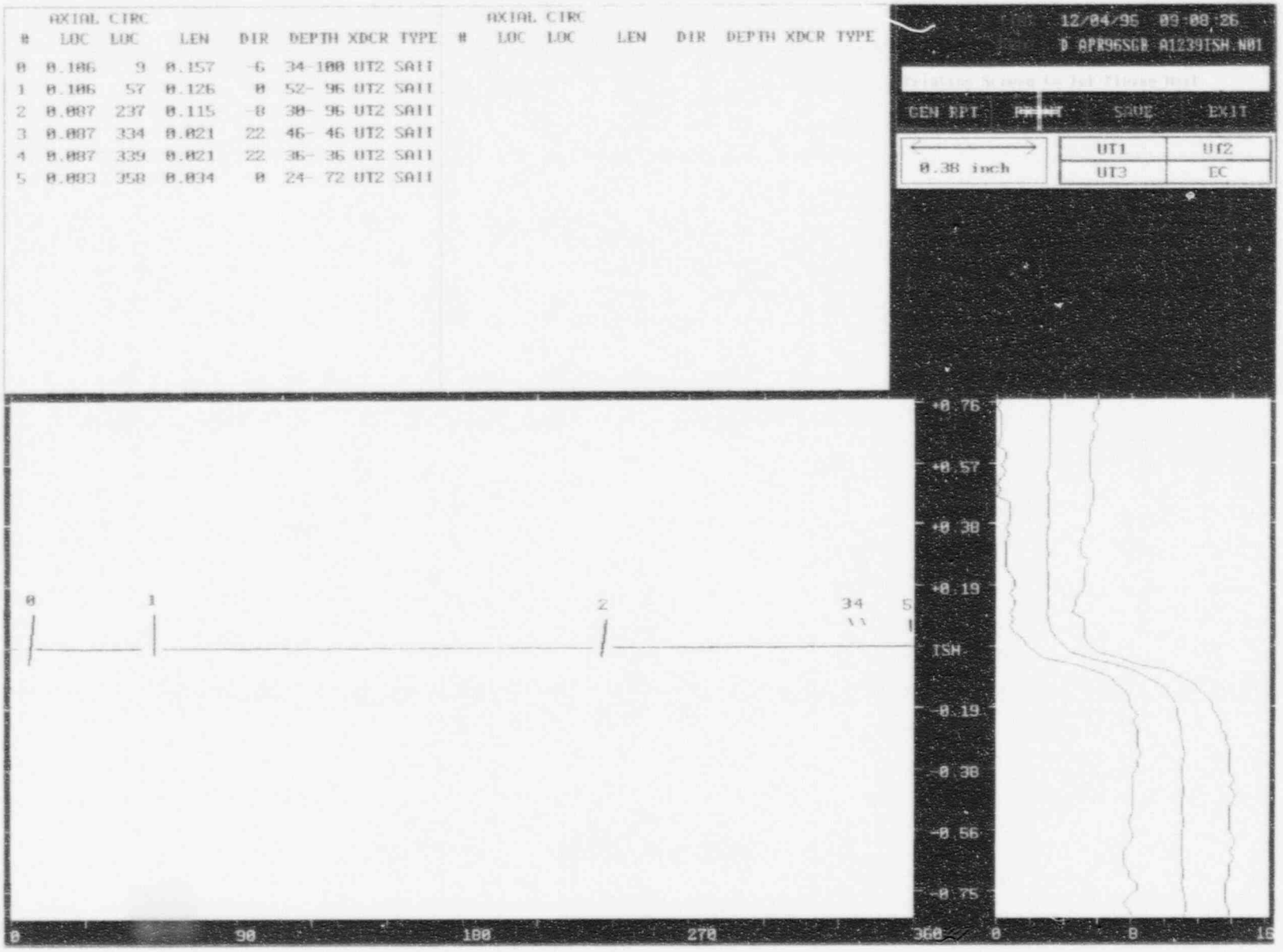


Figure 13
Farley Unit 2 - R12C39, SG B
UT Crack Map for Roll Transition

#	AXIAL LOC	CIRC LOC	LEN	DIR	DEPTH	XDCR	TYPE
0	0.106	9	0.157	-6	34-100	UT2	SAII
1	0.106	57	0.126	0	52- 96	UT2	SAII
2	0.087	237	0.115	-8	30- 96	UT2	SAII
3	0.087	334	0.021	22	46- 46	UT2	SAII
4	0.087	339	0.021	22	36- 36	UT2	SAII
5	0.083	358	0.034	0	24- 72	UT2	SAII

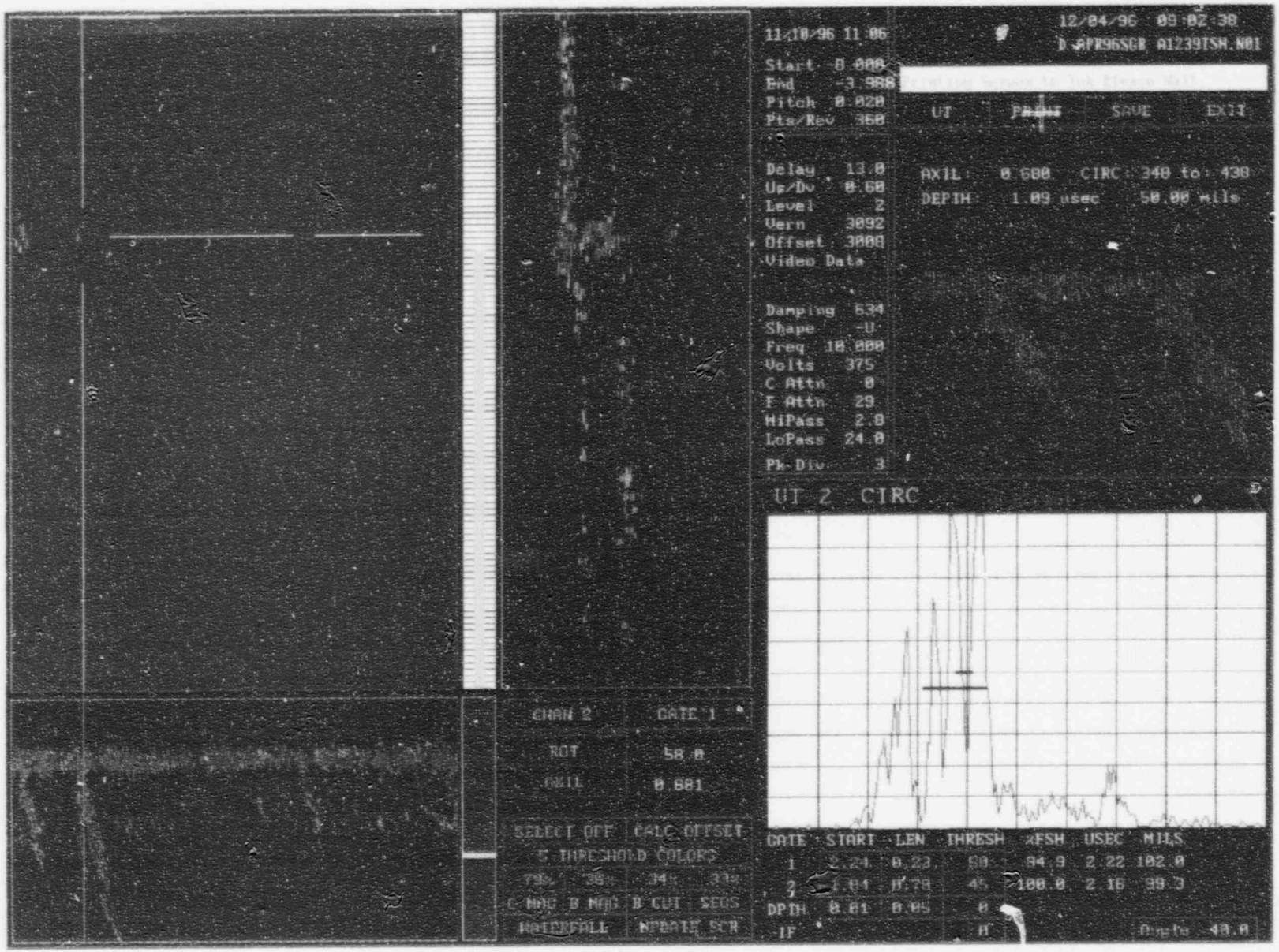


WESTINGHOUSE ELECTRIC CORPORATION - NSD - NDE

CUSTOMER: SOUTHERN NUCLEAR
SITE: FARLEY
OUTAGE: U2R11

ALPHA: APR UNIT: 2 GEN: B LEG: H
FILE: APR96SGB A1239TSH.N01

Figure 14
Farley Unit 2 - R12C39, SG B
UT Response for Roll Transition

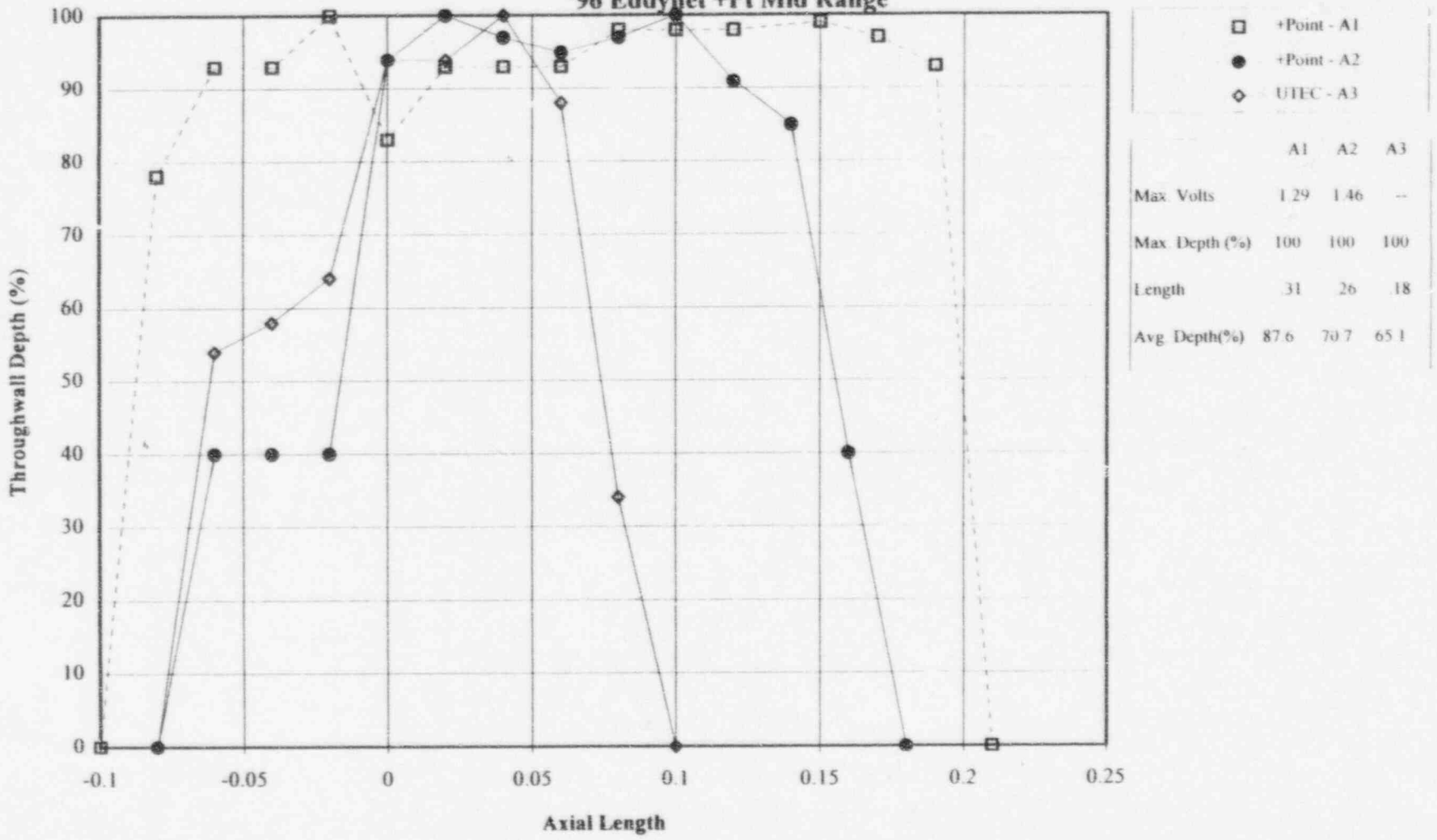


WESTINGHOUSE ELECTRIC CORPORATION – NSD – NDE

CUSTOMER: SOUTHERN NUCLEAR
SITE: FARLEY
OUTAGE: U2R11

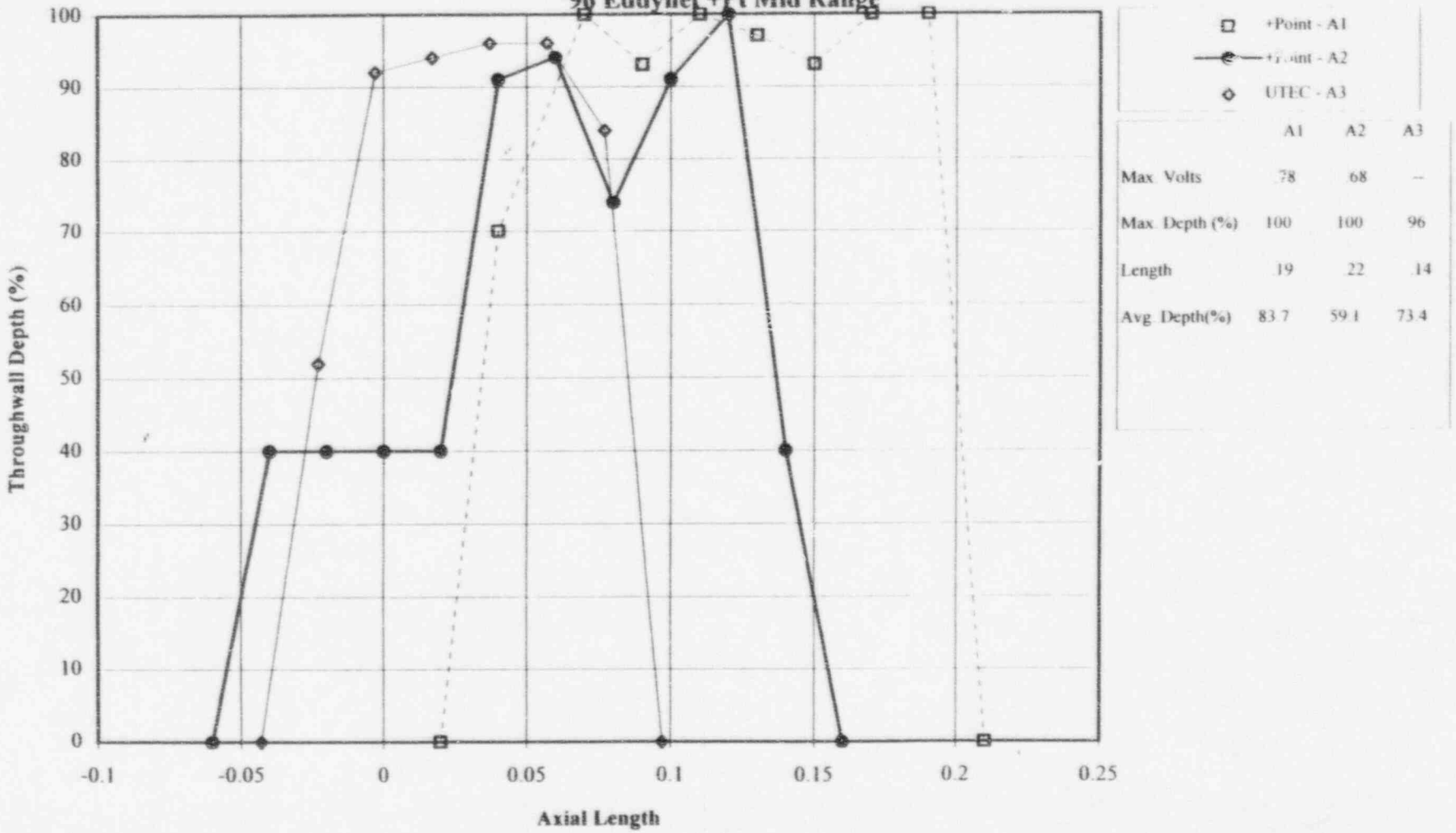
ALPHA: APR UNIT: 2 GEN: B LEG: H
FILE: APR96SGB A1239TSH.N01

Figure 15
Farley Unit 2 - R12C39 SG/B - Crack 1
Axial Length vs. Throughwall Depth
'96 Eddynet +Pt Mid Range



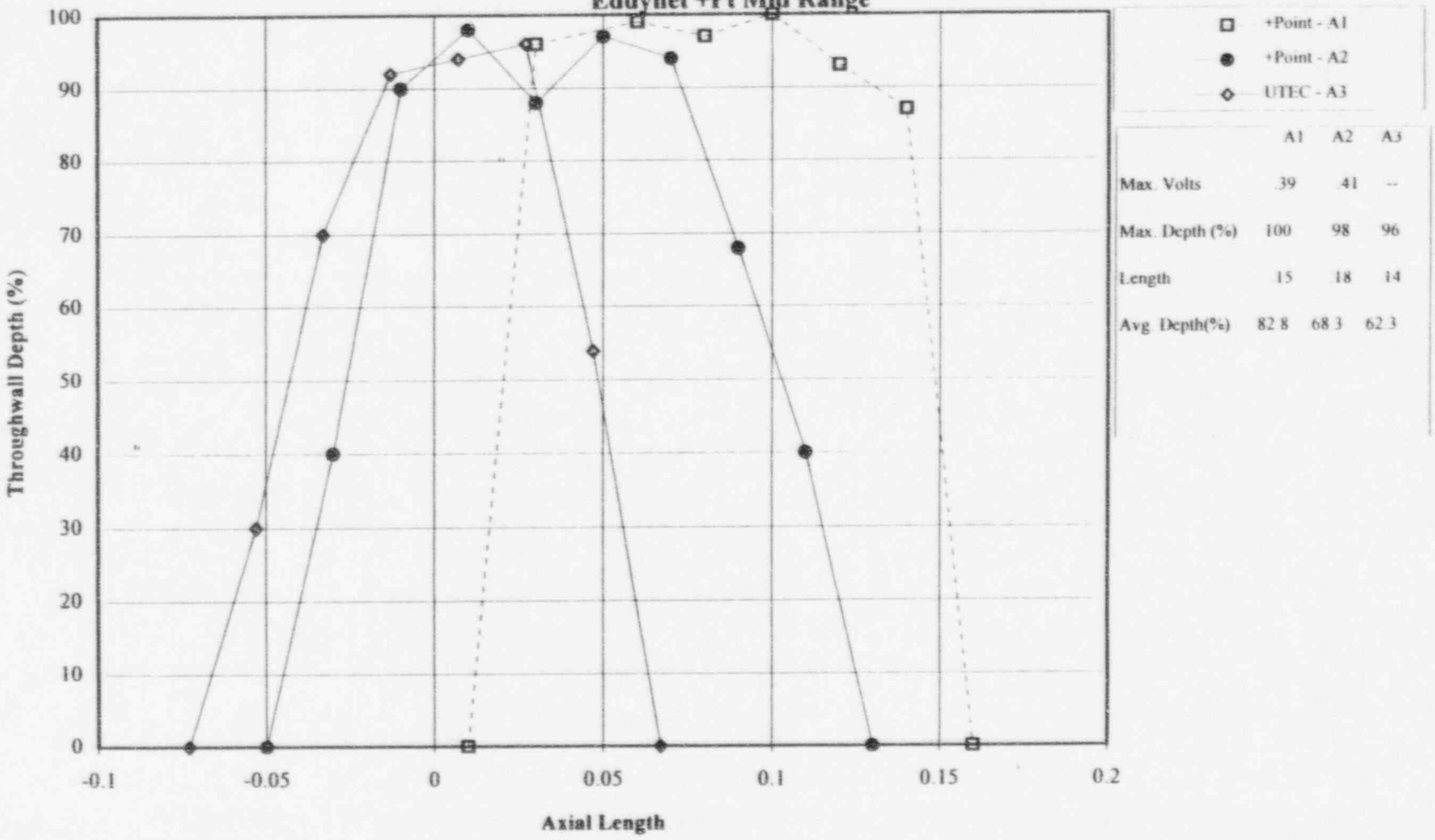
	A1	A2	A3
Max. Volts	1.29	1.46	--
Max. Depth (%)	100	100	100
Length	.31	.26	.18
Avg. Depth(%)	87.6	70.7	65.1

Figure 16
Farley Unit 2 - R12C39 SG/B - Crack 2
Axial Length vs. Throughwall Depth
'96 Eddynet +Pt Mid Range



	A1	A2	A3
Max. Volts	78	68	--
Max. Depth (%)	100	100	96
Length	19	22	14
Avg. Depth(%)	83.7	59.1	73.4

Figure 17
Farley Unit 2 - R12C39 SG/B - Crack 3
Axial Length vs. Throughwall Depth
Eddynet +Pt Mid Range



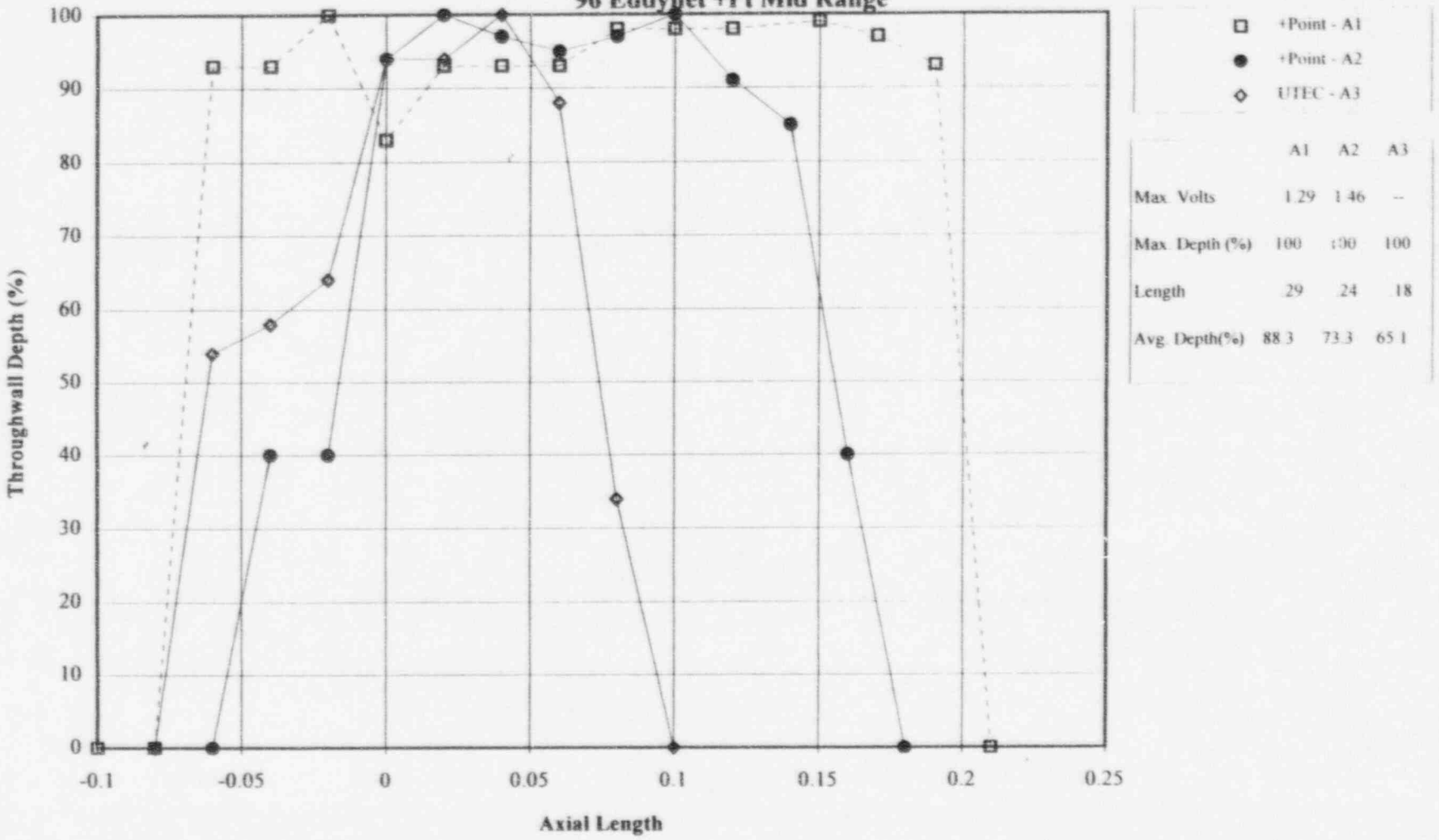
	A1	A2	A3
Max. Volts	.39	.41	--
Max. Depth (%)	100	98	96
Length	15	18	14
Avg. Depth(%)	82 8	68 3	62 3

Figure 18

Farley Unit 2 - R12C39 SG/B - Crack 1 - Length Adjusted

Axial Length vs. Throughwall Depth

'96 Eddynet +Pt Mid Range



	A1	A2	A3
Max. Volts	1.29	1.46	--
Max. Depth (%)	100	100	100
Length	.29	.24	.18
Avg. Depth(%)	88.3	73.3	65.1

Figure 19
Farley Unit 2 - R14C48, SG B
+Point C-scan for Roll Transition

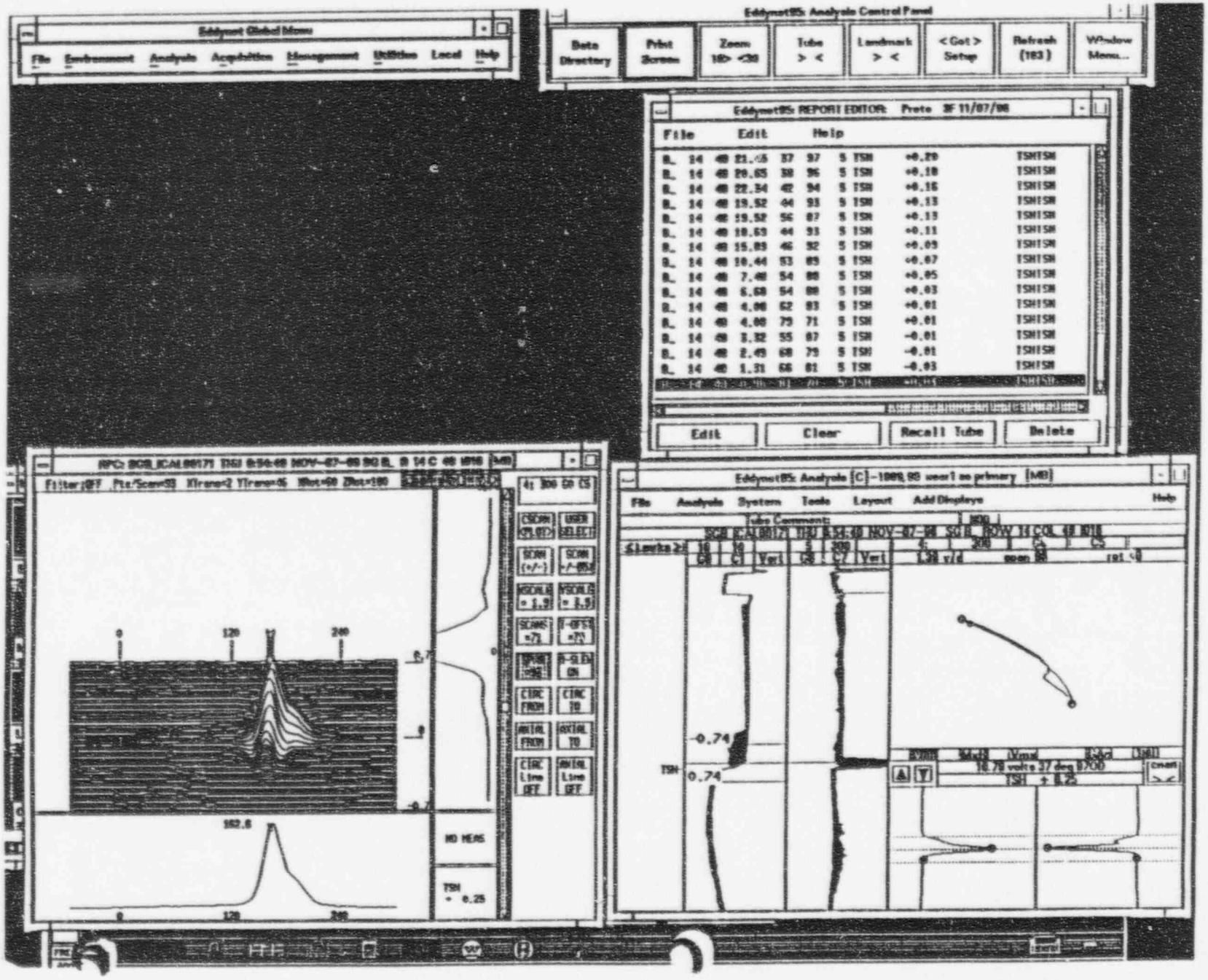


Figure 20
Farley Unit 2 - R14C48, SG B
80 mil Pancake C-scan for Roll Transition

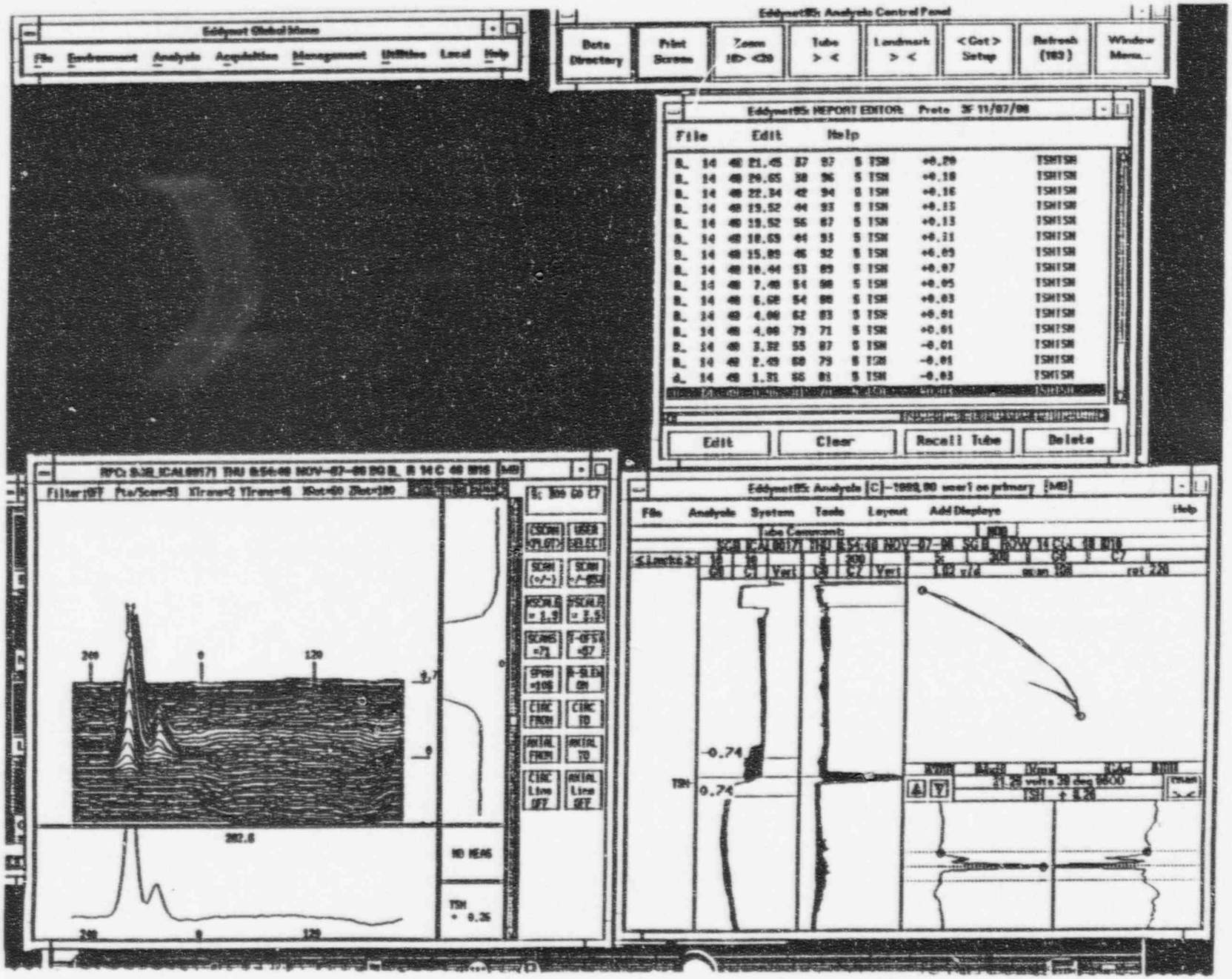


Figure 21
Farley Unit 2 - R14C48, SG B
115 mil Pancake C-scan for Roll Transition

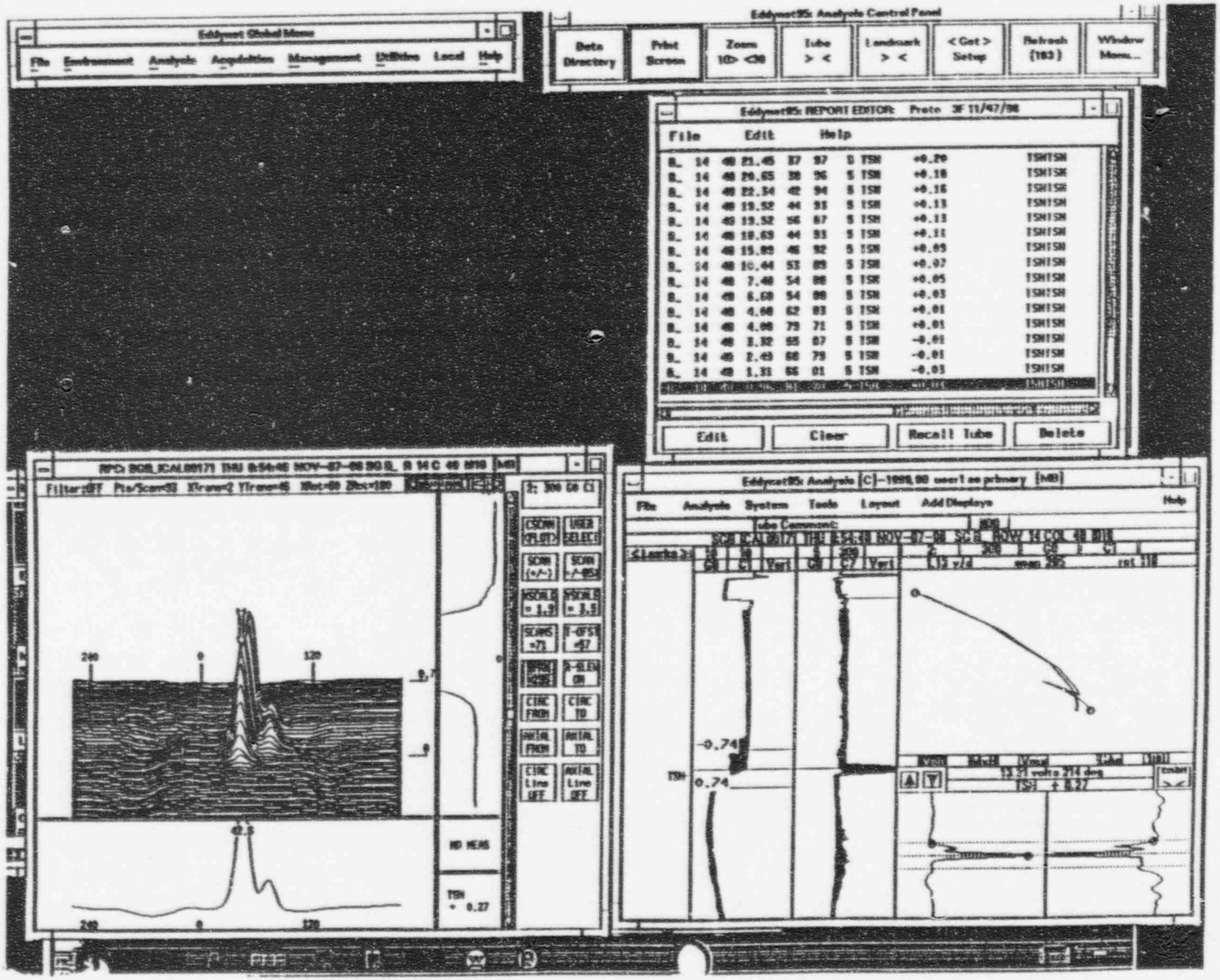
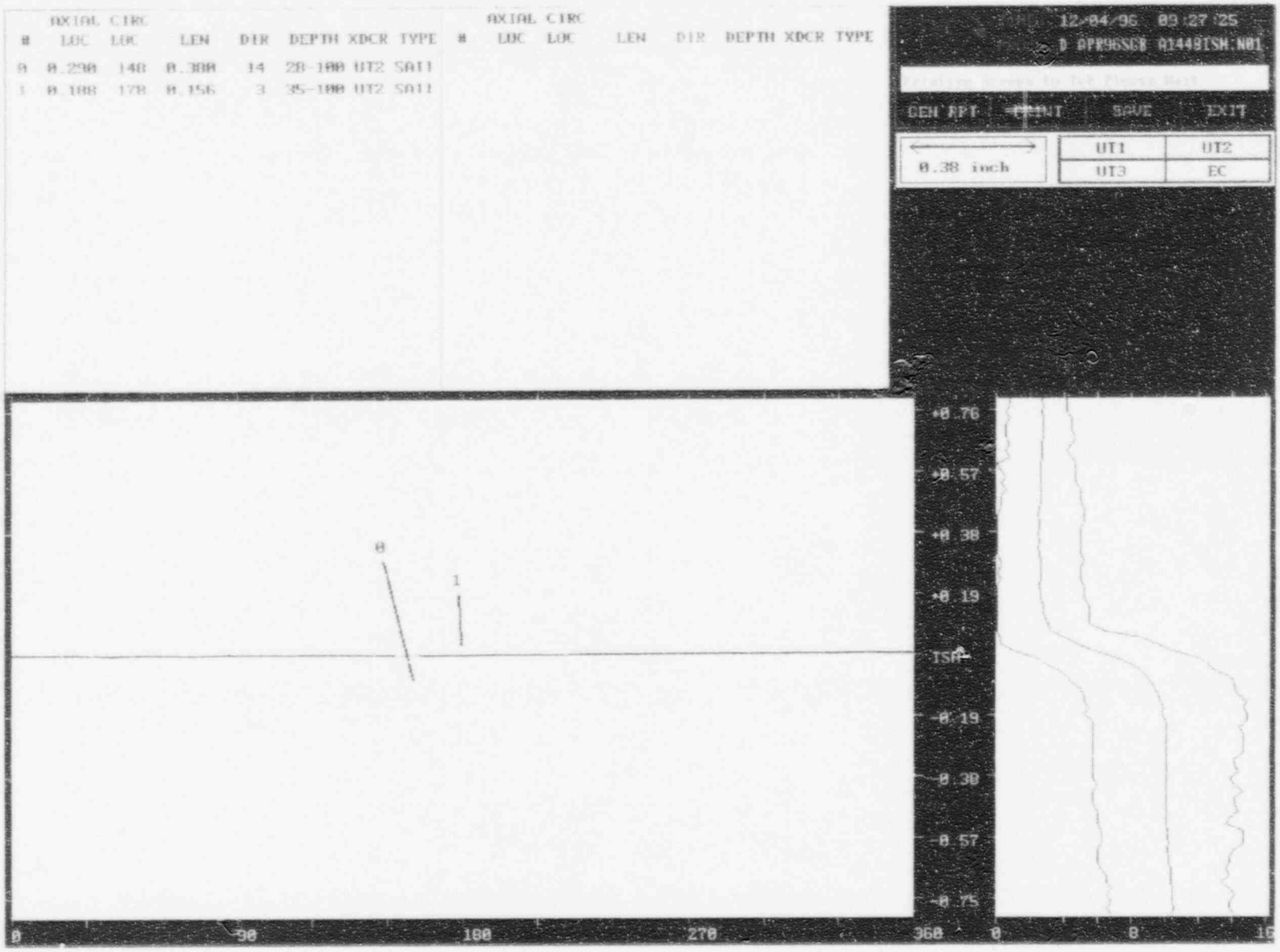


Figure 22
Farley Unit 2 - R14C48, SG B
UT Crack Map for Roll Transition



WESTINGHOUSE ELECTRIC CORPORATION NSD NDE

CUSTOMER: SOUTHERN NUCLEAR

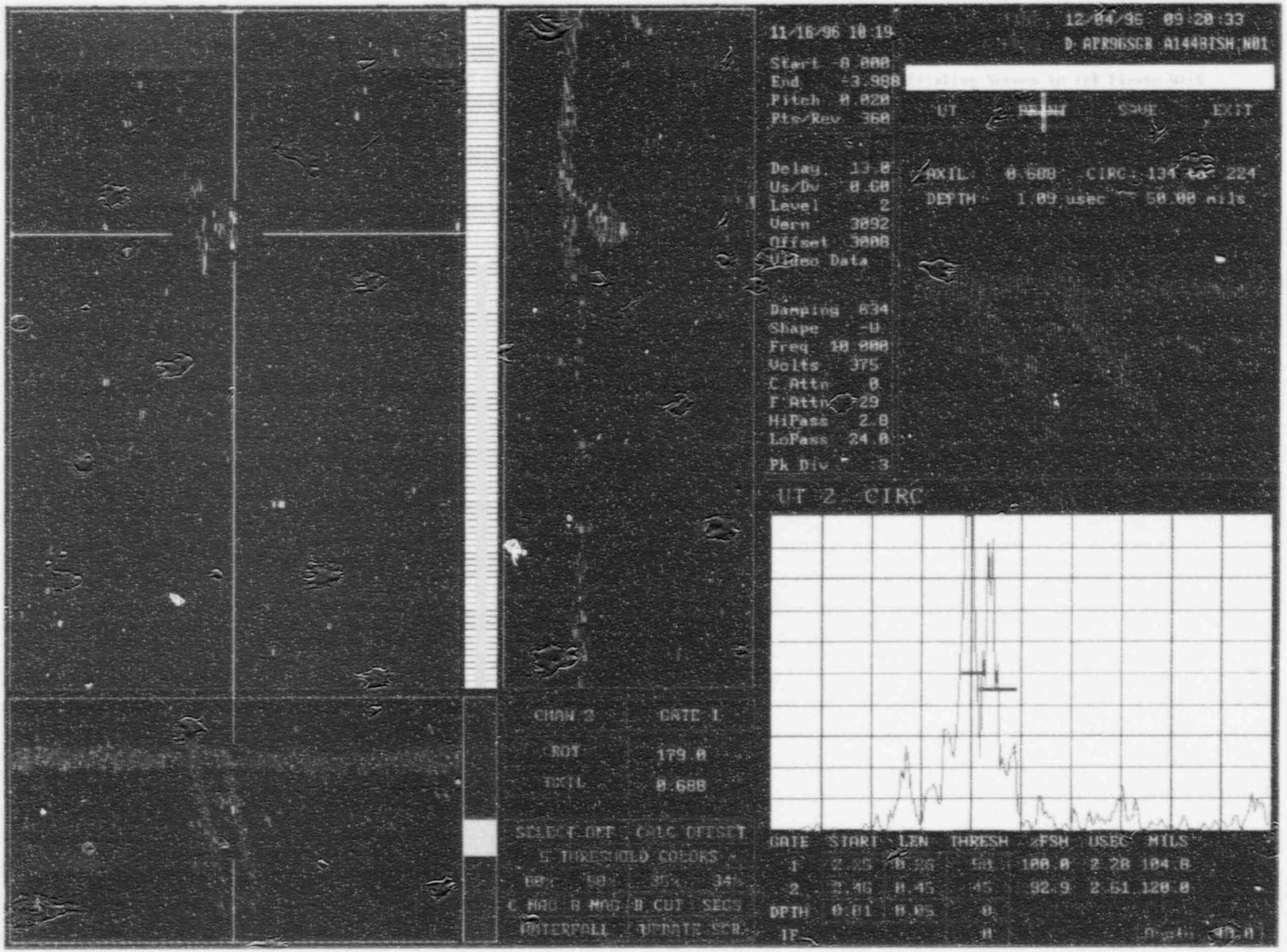
SITE: FARLEY

OUTAGE: U2R11

ALPHA: APR UNIT: 2 GEN: B LEG: H

FILE: APR96SGB A1448TSH.N01

Figure 23
Farley Unit 2 - R14C48, SG B
UT Response for Roll Transition



WESTINGHOUSE ELECTRIC CORPORATION – NSD – NDE

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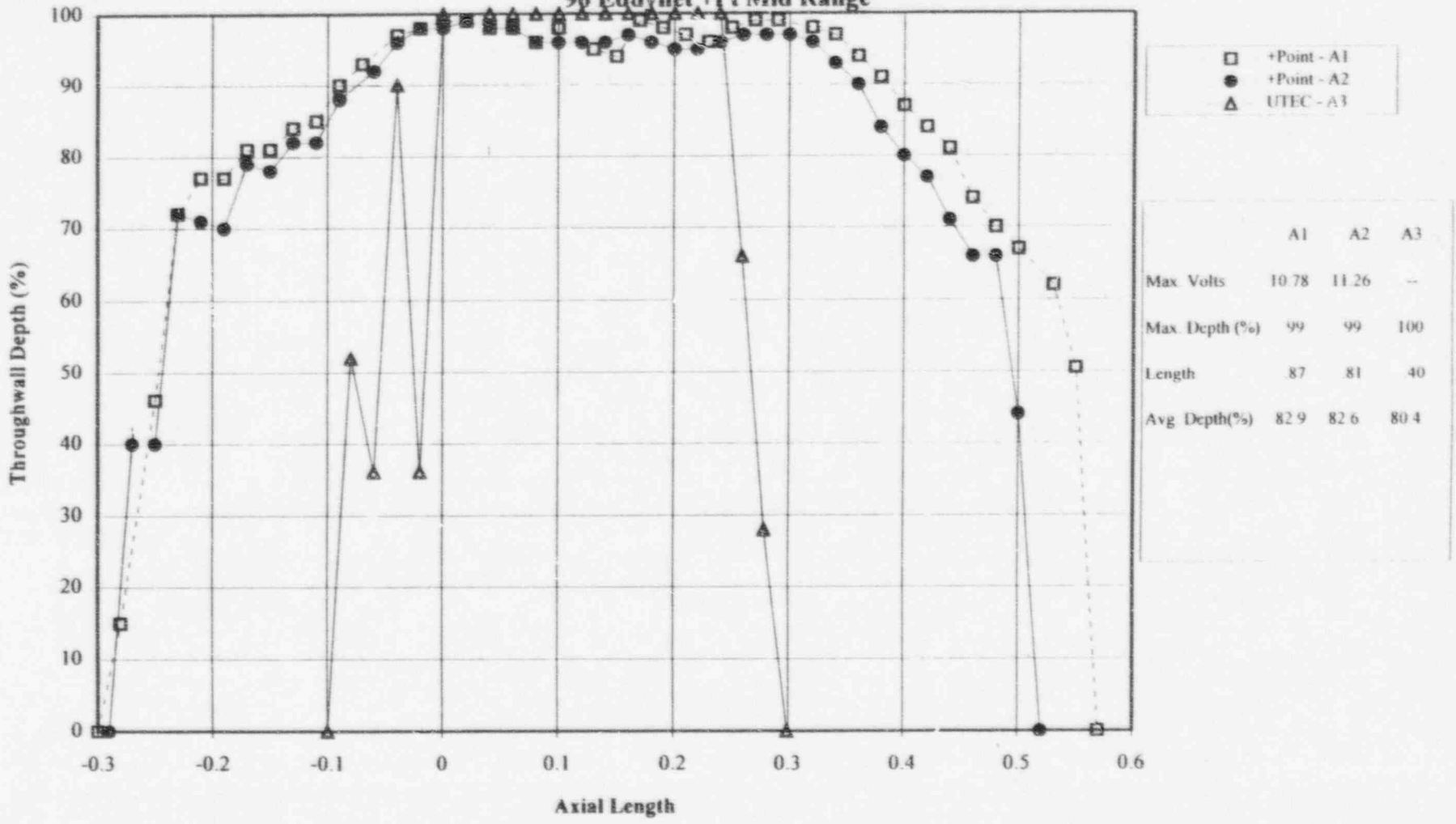
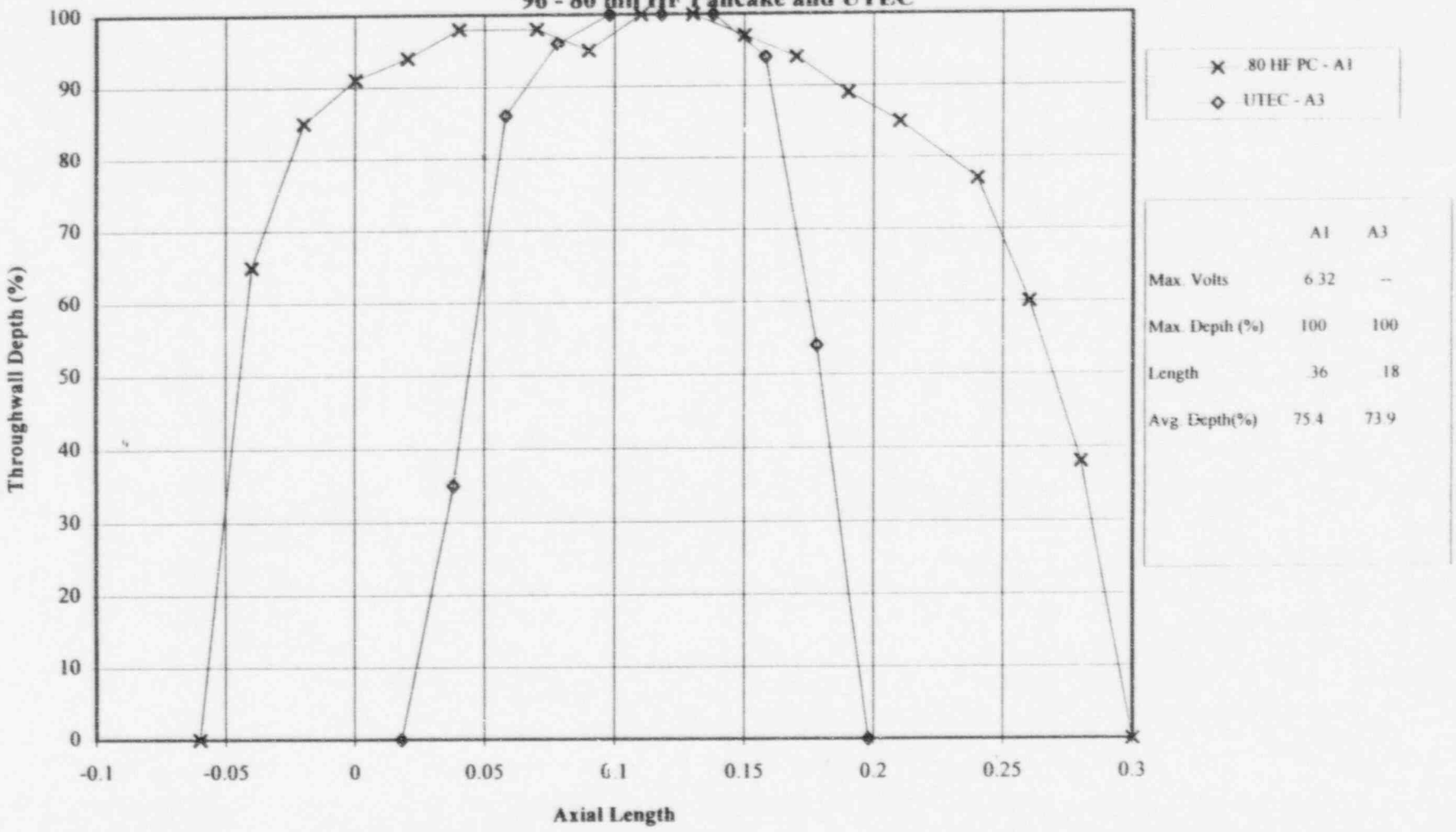
FILE: APR96SGB A1448TSH.N01

Figure 24
Farley Unit 2 - R14C48 SG/B - Crack 1
Axial Length vs. Throughwall Depth
'96 Eddynet +Pt Mid Range



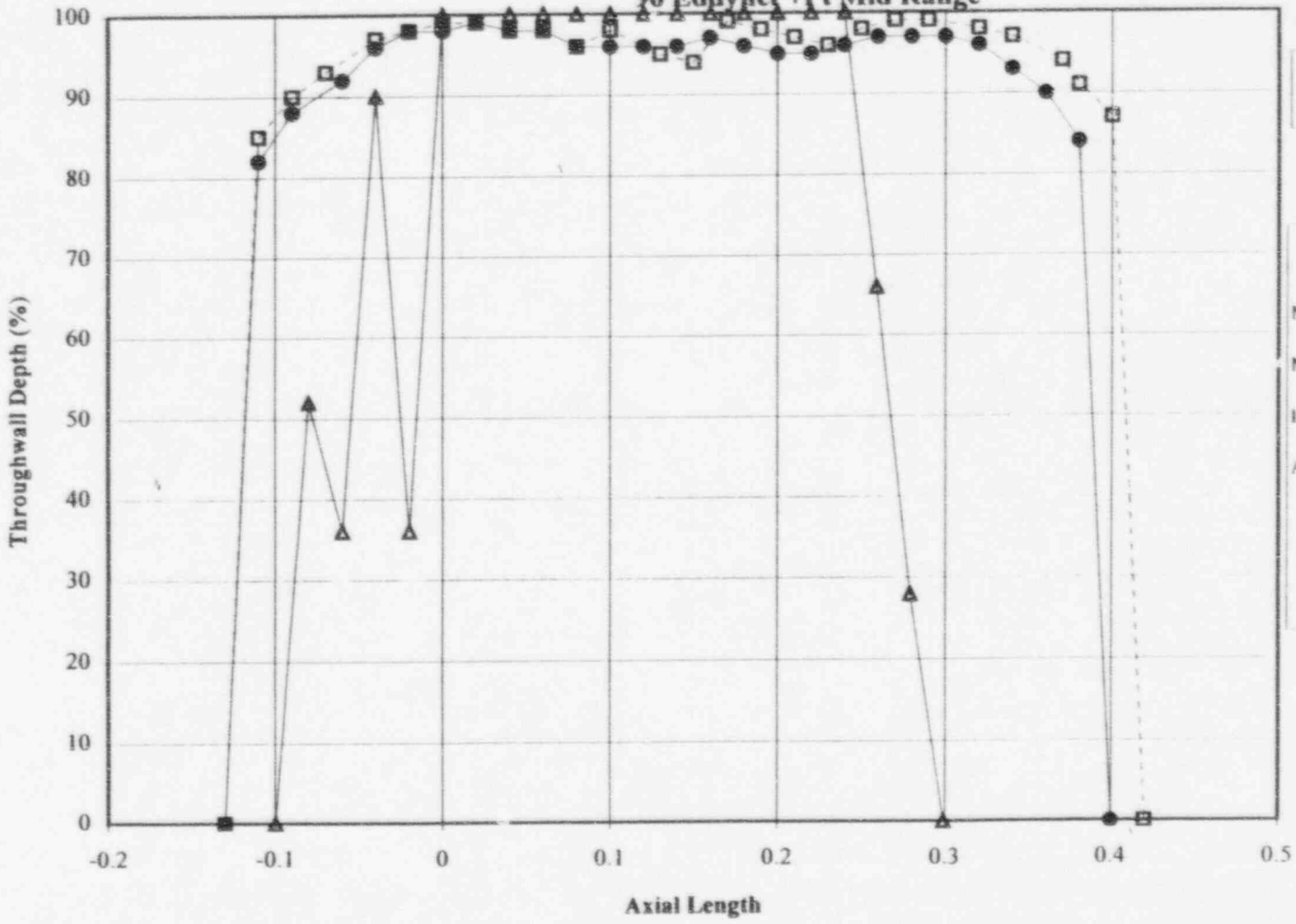
	A1	A2	A3
Max. Volts	10.78	11.26	--
Max. Depth (%)	99	99	100
Length	.87	.81	.40
Avg. Depth(%)	82.9	82.6	80.4

Figure 25
Farley Unit 2 - R14C48 SG/B - Crack 2
Axial Length vs. Throughwall Depth
'96 - 80 mil HF Pancake and UTEC



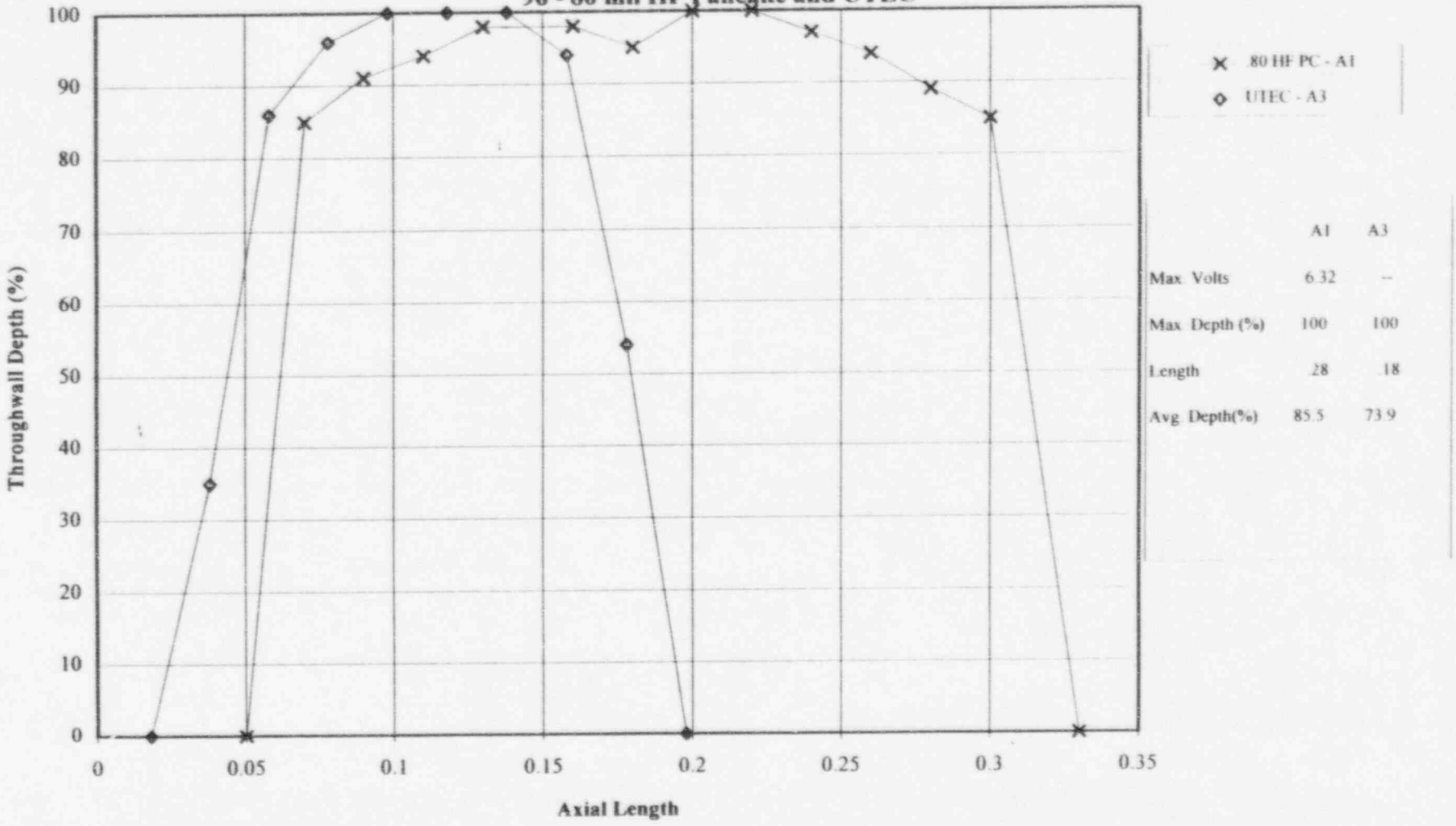
	A1	A3
Max. Volts	6.32	--
Max. Depth (%)	100	100
Length	.36	.18
Avg. Depth(%)	75.4	73.9

Figure 26
Farley Unit 2 - R14C48 SG/B - Crack 1 - Length Adjusted
Axial Length vs. Throughwall Depth
'96 Eddynet +Pt Mid Range



	A1	A2	A3
Max. Volts	10.78	11.26	--
Max. Depth (%)	99	99	100
Length	.55	.53	.40
Avg. Depth(%)	92.4	91.0	80.4

Figure 27
Farley Unit 2 - R14C48 SG/B - Crack 2 - Length Adjusted
Axial Length vs. Throughwall Depth
'96 - 80 mil HF Pancake and UTEC



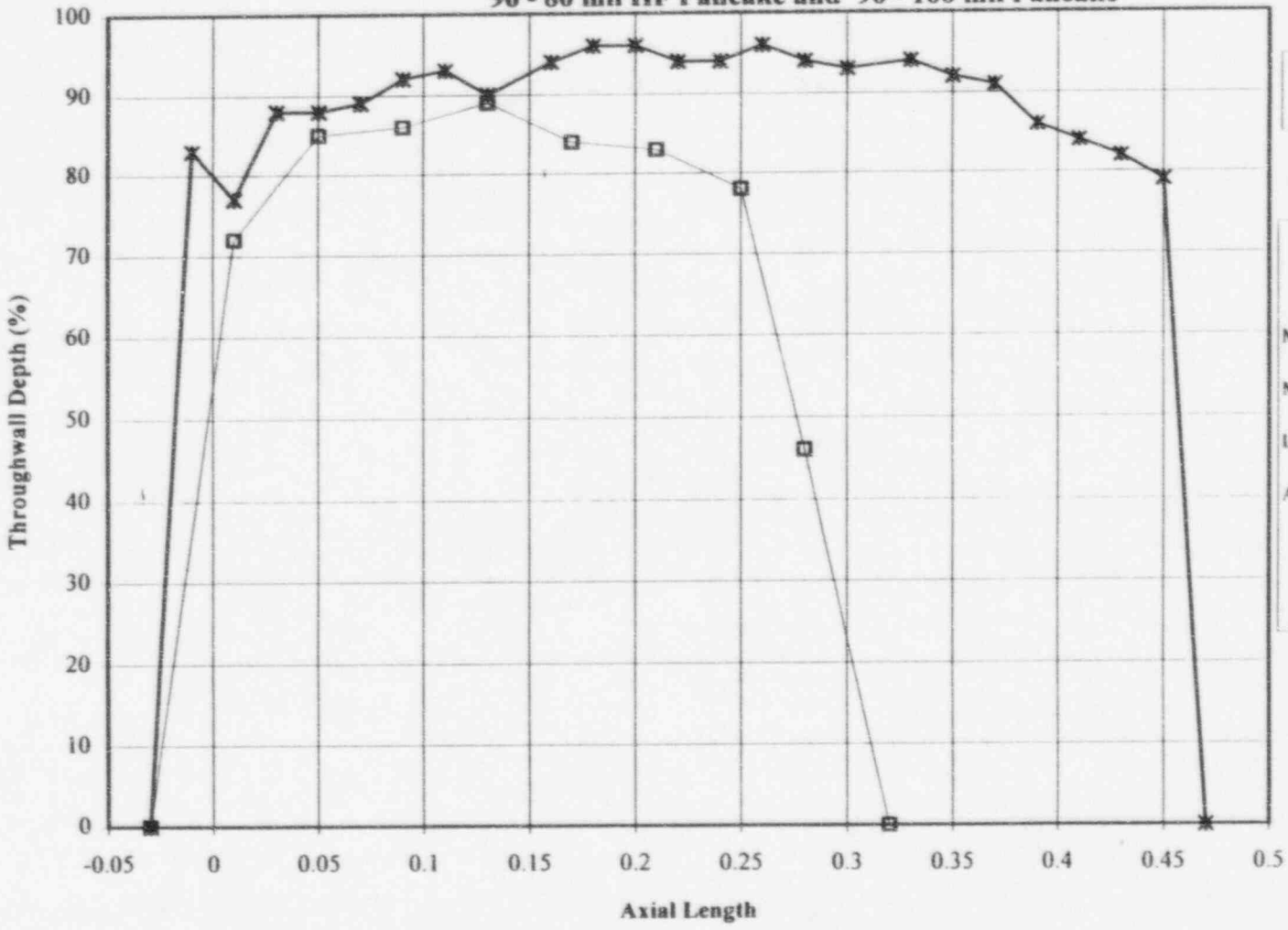
	A1	A3
Max. Volts	6.32	--
Max. Depth (%)	100	100
Length	.28	.18
Avg. Depth(%)	85.5	73.9

Figure 28

Farley Unit 2 - R14C48 SG/B - Crack 1 - Length Adjusted

Axial Length vs. Throughwall Depth

'96 - 80 mil HF Pancake and '90 - 100 mil Pancake



	A1 '96 PC	A1 '90 PC
Max. Volts	22.34	4.83
Max. Depth (%)	96	89
Length	50	35
Avg. Depth(%)	86.3	69.4

Figure 29
Farley Unit 2 - R18C42, SG C
+Point C-scan and Voltage Integral for Roll Transition

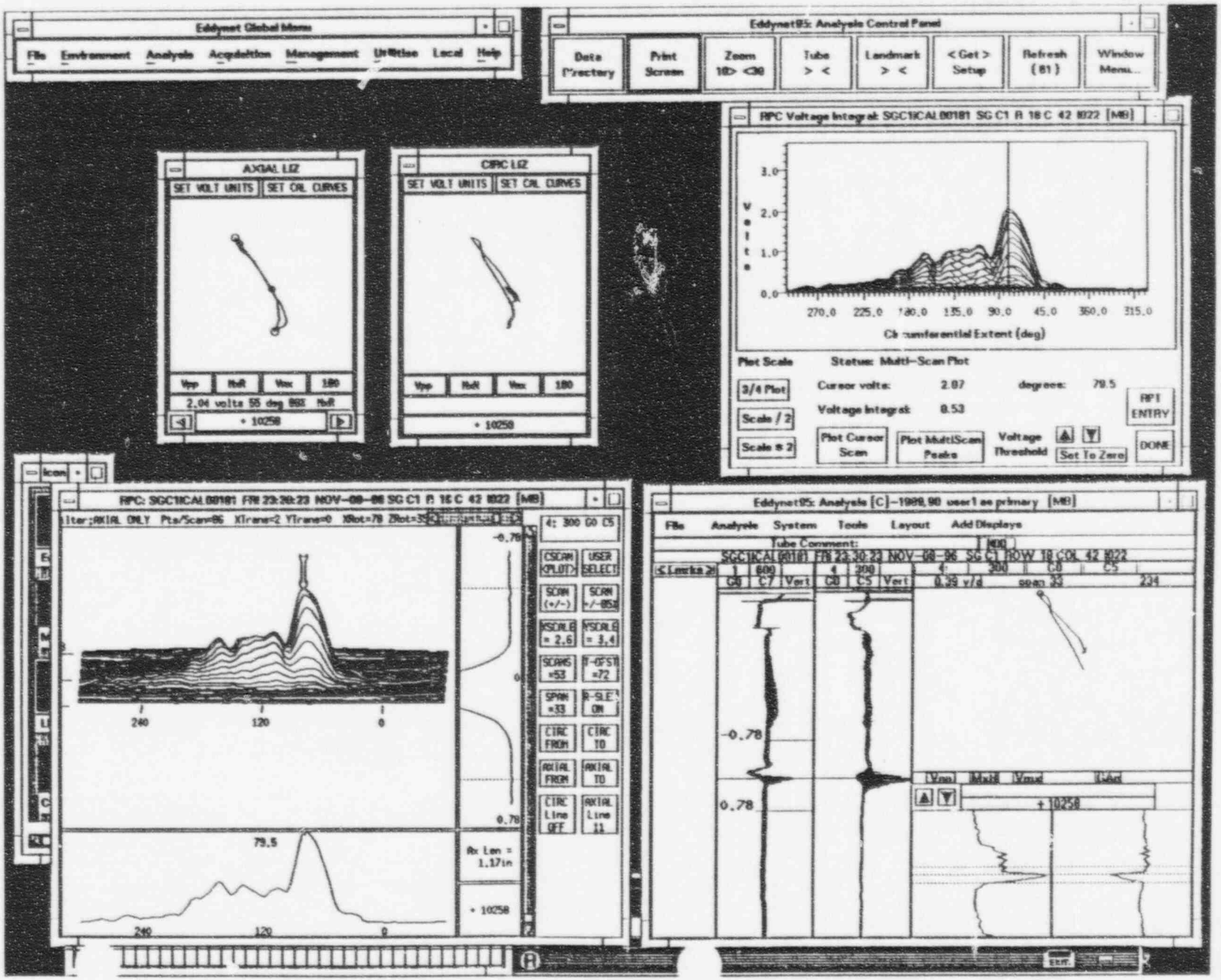
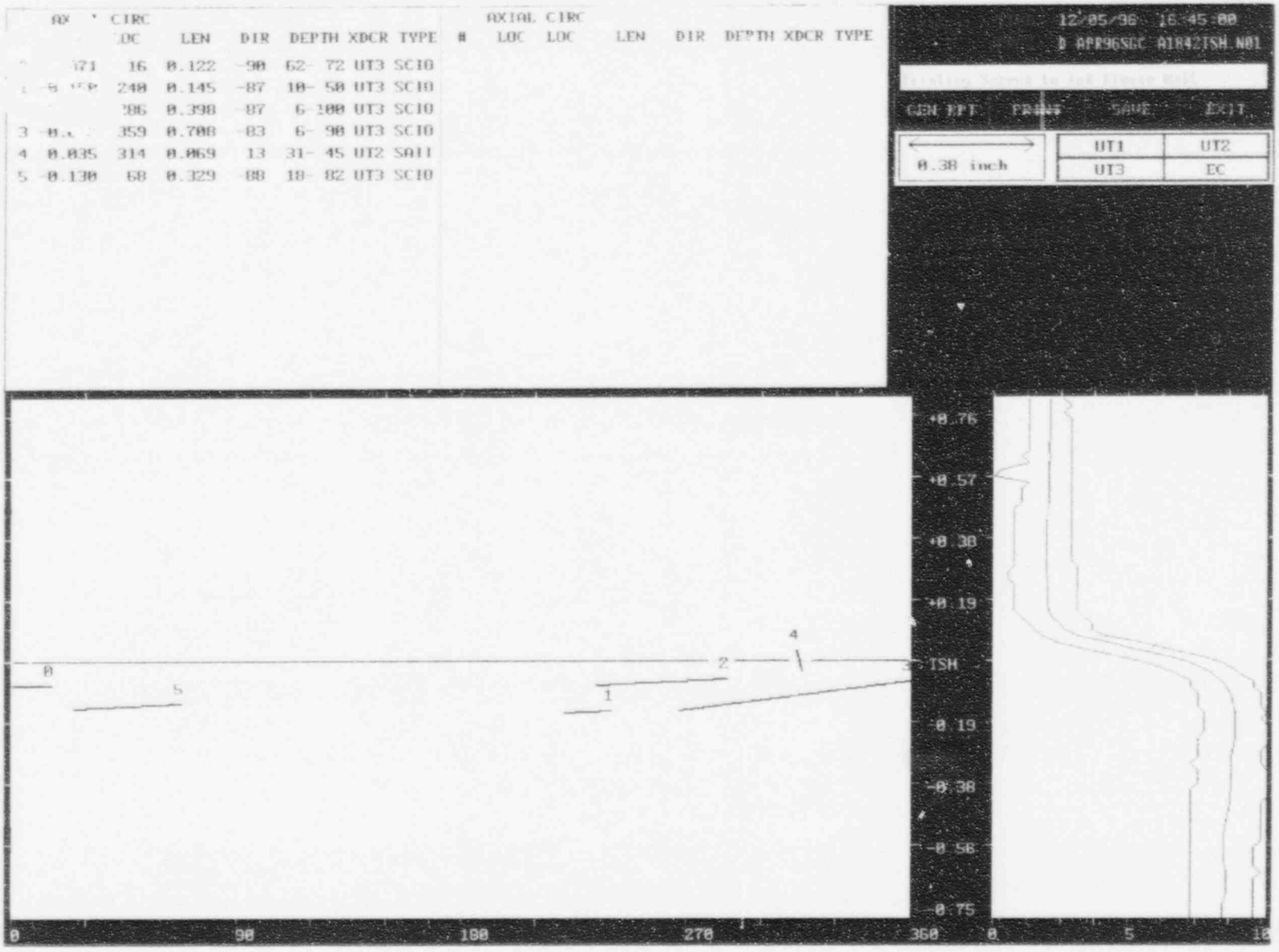


Figure 30
Farley Unit 2 - R18C42, SG C
UT Crack Map for Roll Transition



WESTINGHOUSE ELECTRIC CORPORATION - NSD - NDE

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FILE: APR96SGC A1842TSH.N01

Figure 31
Farley Unit 2 - R18C42, SG C
UT Circumferential Response

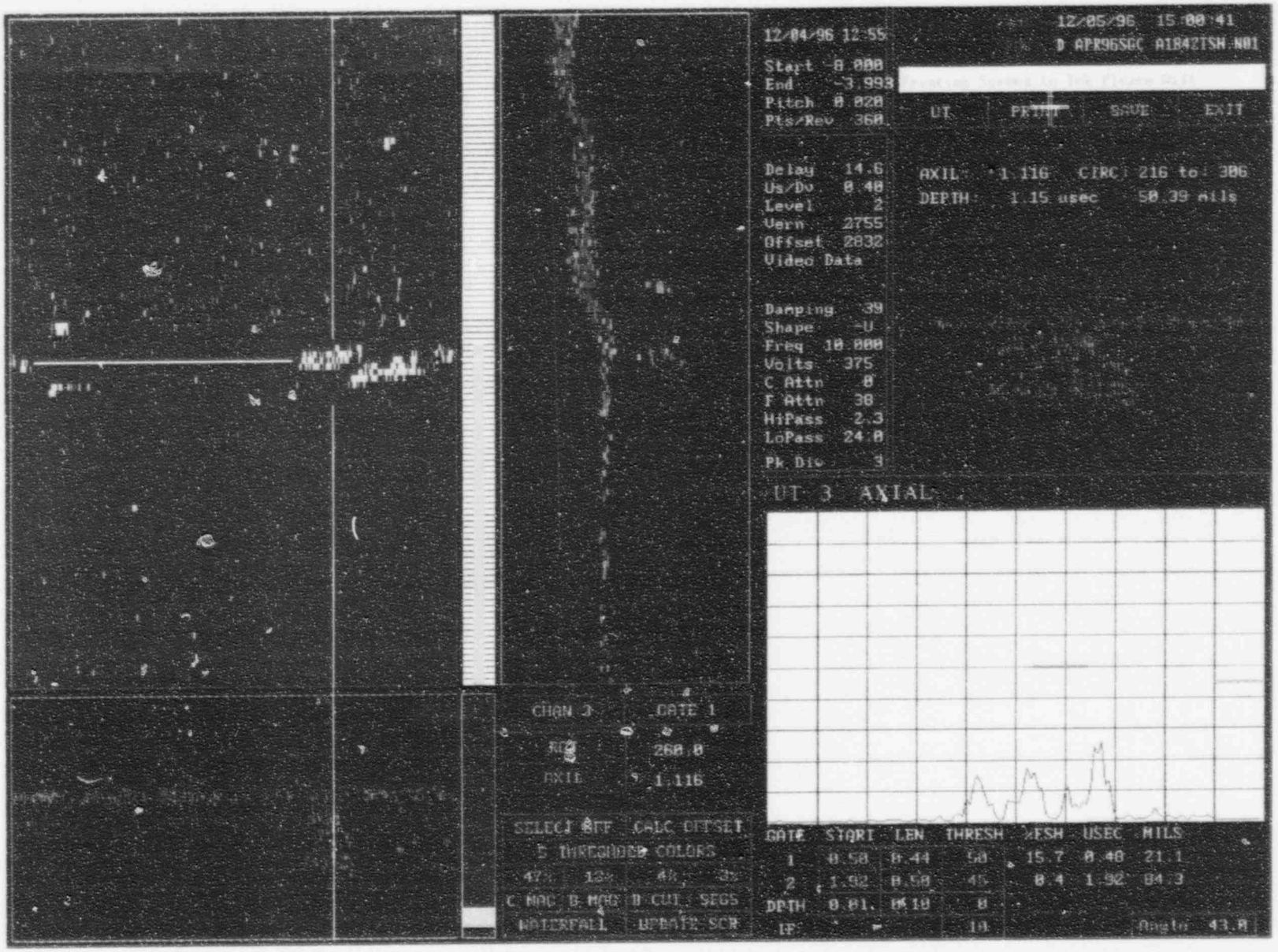

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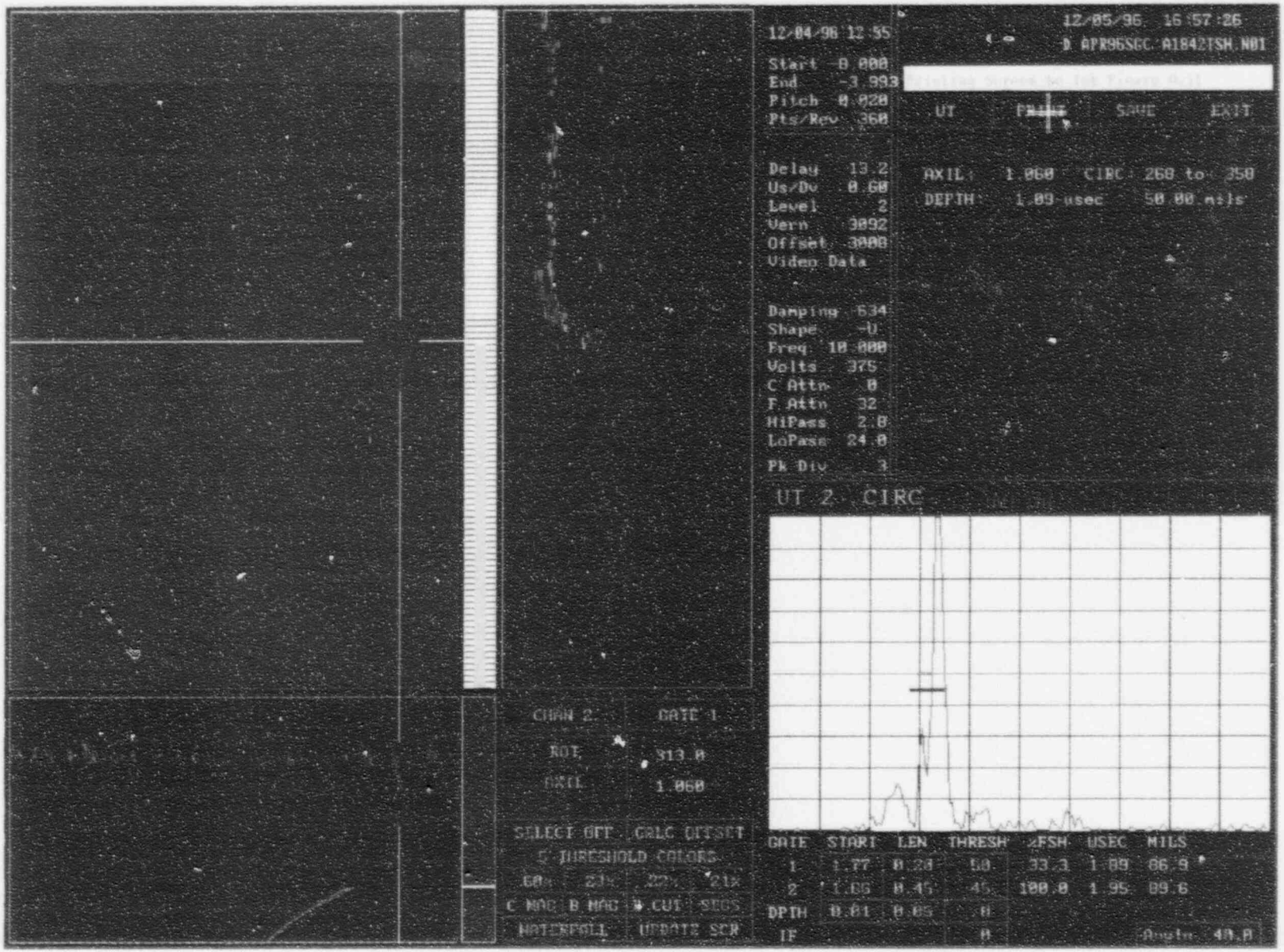
Figure 32
Farley Unit 2 - R18C42, SG C
UT Axial Response

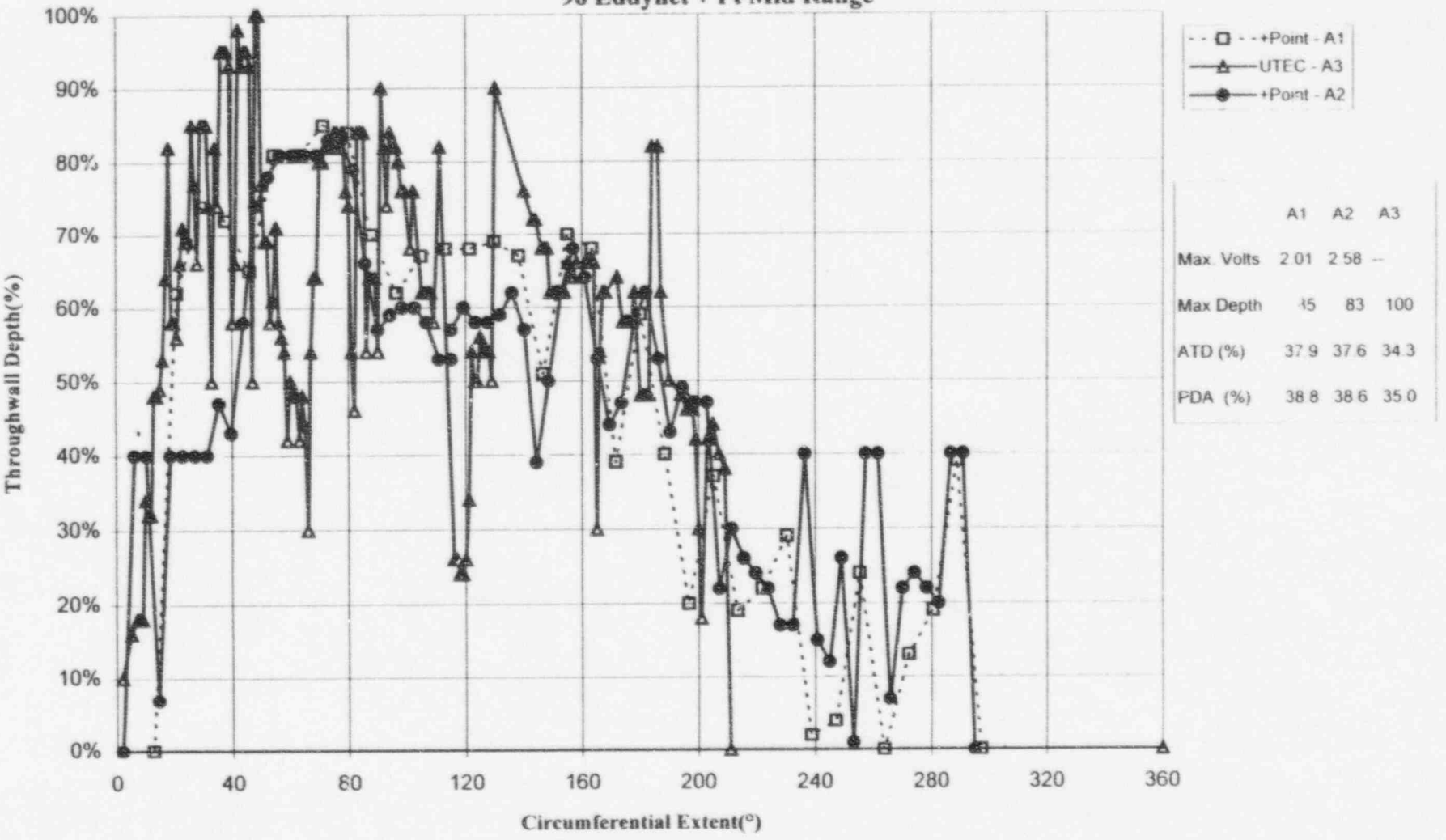


WESTINGHOUSE ELECTRIC CORPORATION - NSD - NDE

CUSTOMER: SOUTHERN NUCLEAR
SITE: FARLEY
OUTAGE: U2R11

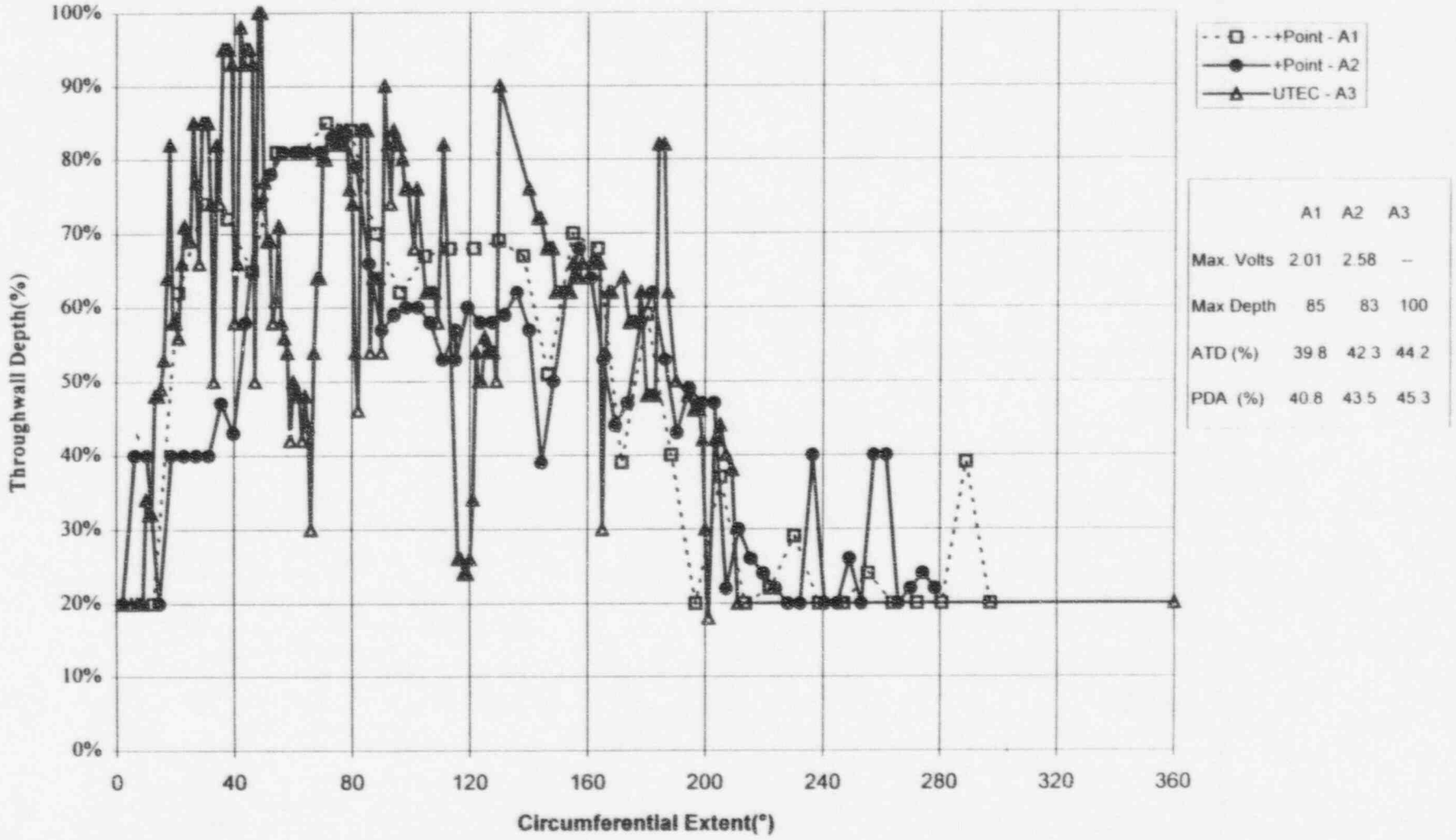
ALPHA: APR UNIT: 2 GEN: C LEG: B
FILE: APR96SGC A1842TSH.N01

Figure 33
Farley Unit 2 -R18C42 SG/C
'96 Eddynet + Pt Mid Range



	A1	A2	A3
Max Volts	2.01	2.58	--
Max Depth	45	83	100
ATD (%)	37.9	37.6	34.3
PDA (%)	38.8	38.6	35.0

Figure 34
Farley Unit 2 -R18C42 SG/C - Adjusted to 20% Minimum Depth
'96 Eddynet + Pt Mid Range



	A1	A2	A3
Max. Volts	2.01	2.58	--
Max Depth	85	83	100
ATD (%)	39.8	42.3	44.2
PDA (%)	40.8	43.5	45.3